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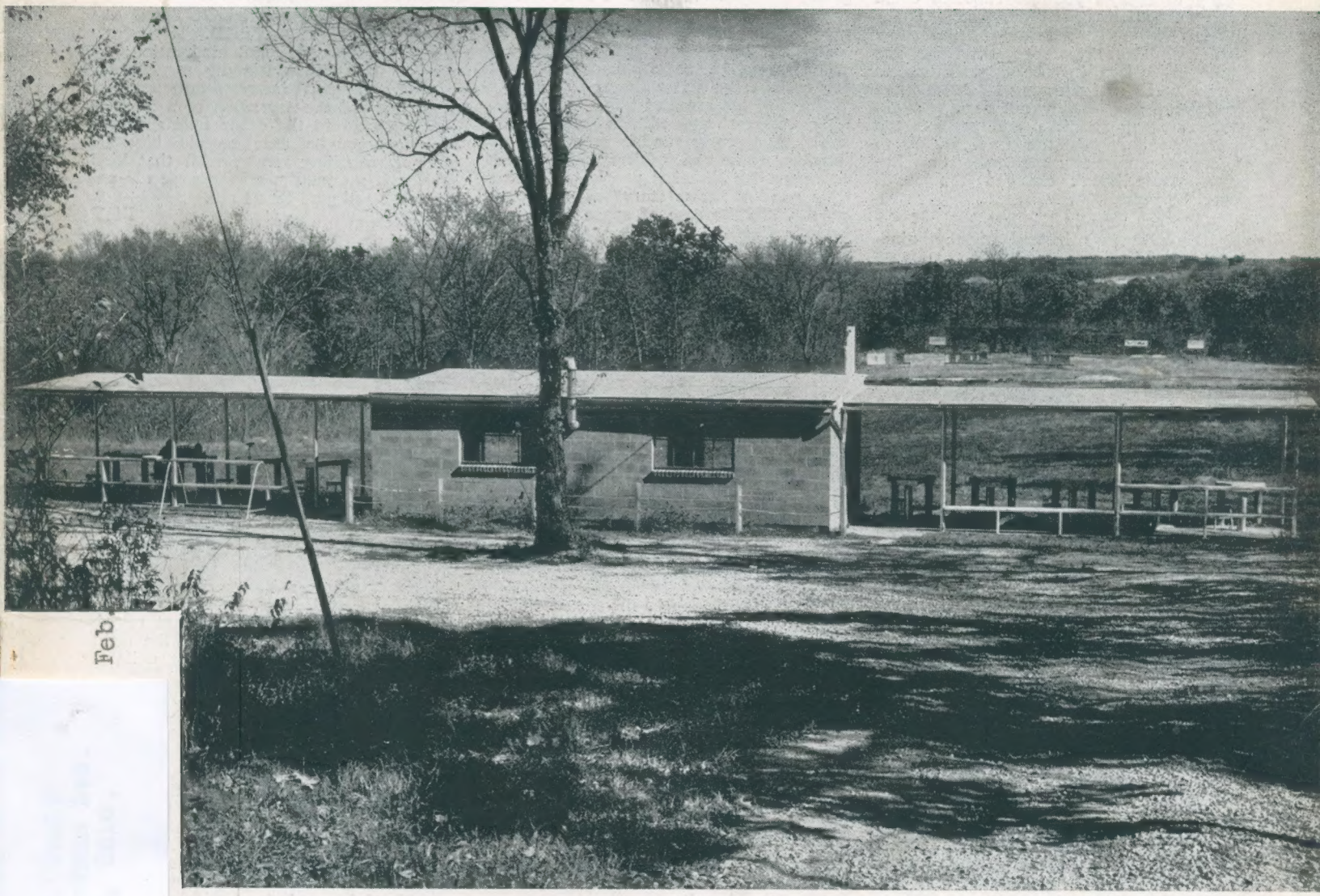

MILL CREEK RIFLE CLUB BENCH REST RANGE

Feb.

a magazine for Shooters by Shooters

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TODAY'S SHOOTING INFORMATION IS NEEDED

Harvey Donaldson's letter on another page prompts the following comments.

It is without doubt quite true that many of today's younger shooters could save themselves considerable unnecessary effort, and perhaps some grief, if they had a greater knowledge of what has gone on before in shooting. Complete reference files of shooting information of years ago is probably not readily available to many shooters, and perhaps too many wouldn't take the time to refer to it if it were readily available, since human nature hasn't changed too much over the years.

We are now in the last half of the twentieth century instead of the nineteenth and it is only natural that most of us are a bit more interested in the present than in the past. We have made progress in shooting, weapons and accessories, though perhaps not so much as we like to think we have. We do have many different products to work with. We who are interested in firearms as something more than a tool to be used a very few times a year in hunting do need, or at least want, reports and information of what is going on in shooting TODAY.

It is much too true that too many of us are prone to jump to hasty and not infrequently wrong conclusions, based on entirely too little experience. When the experiences leading up to such "conclusions," "opinions," or just "guesses" are reported where other shooters over a wide area may read them, it is quite probable that someone who KNOWS, or someone who has had different results from similar experiences, will make a counter report, and in the end we on the sidelines may learn something.

Precision SHOOTING does not pretend to be the last word in shooting FACT. Its goal is to provide a periodical facility for shooters the country over to report their experiences in shooting, and with firearms, and to discuss common sport shooting problems. If that facility is made full use of, Precision SHOOTING will hold a place in the shooting world, and we all may gain some benefit from it.

When reporting shooting, firearms or loading experiences it is most important that all factors having any bearing on the experience be reported in detail. Just the change of one or two factors might give entirely different results, and in some cases might result in a dangerous condition.

P. H. T.

SLANTED EDITORIAL POLICY

In Ernest Stuhlschuter's column this month he mentions that it troubles him that some people consider the P. S. editorial policy "slanted," but he doesn't mention in what direction the "slanting" is supposed to be.

Is the P. S. editorial policy "slanted"? I think the "editorial" policy IS slanted and I certainly believe that it should be. But first let's get it straight what we are talking about.

The contents of the magazine (aside from paid advertising) may be divided into three broad departments: Reports of events; articles, columns, letters, etc.; and strictly "editorial" writing. The strictly editorial material is the smallest item in the magazine's contents, and if editorial writing isn't "slanted" to try to influence readers along lines that **the editor believes to be GOOD,** then that writing is a waste of time and space.

Reporting events (competitions, meetings, etc.) is a matter of telling what the event was, where and when it took place, and who did what. In some cases, space limitations determine how complete a report is printed. However, in far too many cases a shooting editor must try to make a readable news story for a shooting event from a few sheets of bare statistics that are supplied him. Time available, interest, the editor's ambition at the time, a pretty good knowledge of the shooting game and a fairly wide acquaintance among shooting people, determines how good a "news story" of the event results. In the case of space limitations, "slanting" will result from the editor's choice of what to use and what to drop, and that will be influenced by his judgment and, undoubtedly to some extent, by his own interests in the event reported—editors are human and fallible.

Articles, columns, letters, etc., normally convey information or state personal opinions. While an editor may not, and frequently does not, entirely agree with information or opinions of writers, he should be wise enough to realize that he may not know everything and that the other fellow may be right. Some information (?) or opinions printed may draw further writing from other people, and the total may be well worthwhile. "Slanting" may result from the selection of material used, but that again is a matter of the editor's judgment which can be wrong some of the time.

Some discussions arising in the "Letters" department tend to go on and on, and the editor has to call a halt somewhere to prevent repetition and boredom. Again, a matter of editorial judgment which is not infallible.

Precision SHOOTING has no facilities for laboratory testing of any products. When the editor or some of his helpful friends report on a new product, it means we actually tried it, as any potential purchaser might do, and we try to report simply how we tried it and what results **we** had. Someone else, under different circumstances of use, might not get identical results.

I suspect that what was meant by "slanted" editorial policy is that some, perhaps many, consider that the entire contents of the magazine are "slanted." That may be quite expected and I believe the degree and the direction of the "slant" will be determined by the interests and opinions of each individual reader.

While Precision SHOOTING contents field is pretty strictly limited to small arms with rifled barrels for individual sport use, that field is broad enough to have numerous sub-divisions of usage and special interests, which cannot all be served in any one issue of any magazine. We try to strike as good a "balance" as we are able over a period of months, and letters we receive indicate that we are having some degree of success in doing that. You folks, by reporting your own experiences in your own special interest fields, can help keep and improve that "balance." Too, a lot of us can learn useful bits from the other fellow's game, if we'll only consider it with an open mind.

The "Editorial Policy" of Precision SHOOTING is founded on the firm belief that shooting as a sport and hobby must be governed by GOOD SPORTSMANSHIP if it is to be desirable. Our interpretation of good sportsmanship is simply the mechanics of putting the age old GOLDEN RULE for human conduct to work in a practical manner.

Yes, the Precision SHOOTING editorial policy IS SLANTED. It is slanted toward tolerance and moderation; toward a reasonable, friendly regard for the other fellows' interests and point of view; toward the extension of a friendly helping hand to the other fellow whenever we may be able to aid him. If there is anything wrong with that kind of slanting, then I'm an ignorant old so-and-such and glad that I am.

PHT

SHOOTING METALLIC SIGHTS

It may be true that some people have such poor eyesight that it is impossible for them to make respectable scores when shooting metallic sights, but I believe they are a very small minority. The average older person who **THINKS** he cannot shoot successfully with metallic sights, either just lacks confidence or the will to seriously try to shoot the irons.

It is true that more care and attention to detail must be given to sighting when using metallic sights than is the case when using scope sights. Clear, distinct appearing sights are necessary for good, uniform sight alignment. If the sights may be seen clearly, the bullseye may be hazy, gray, even not round, and good scores can result if the sight picture and alignment are kept uniform from shot to shot.

It has always been this writer's contention that anyone should learn to shoot a rifle with metallic sights, and keep at it until the details of position, aiming, trigger release, etc., have been mastered to the point of consistently shooting good scores. If one will then go to scope sights, he will be able to detect his holding errors, and correct them. After improving his holding while shooting the scope, the shooter can then go back to metallic sights and shoot with them better than ever, providing he will have confidence and give the necessary attention and care to his sighting.

If one has to wear corrective eyeglasses, lenses may be corrected to give the clear, distinct sight appearance if that is necessary. Give the metallics a fair, honest trial and you may be pleasantly surprised.

PHT

LETTERS

NEW RANGE APPRECIATED

Dear Phil: . . . . . now that the competitive season has ended the experimenting can begin, if the weather does not long continue as it is now. We have the use of the Pan-Am range, which has now become the Waukegan International Shooting Association under the direction of ex-Sgt. James L. Wade, late of the Army. We are shooting three position matches among ourselves under ISU rules, but other than having fun, learning a lot about a somewhat foreign game, and slowly watching the scores rise, we would only be red-faced to report our scores.

The addition of a portable shooting bench has done wonders for the testing of the .308 which is getting down to the accuracy of a real bench rest rifle with the help of some new bullets not yet available. It is really a pleasure shooting in a well designed shooting house with concrete floor, lights, heat and a lot of other conveniences not normally associated with a range.

Military firing points are in the not too distant future, so that it is hoped to have facilities for 50, 100 and 300 meters and 200 and 300 yards, all capable of being used without the necessity of stop ping for target changes, while the range is in operation. This should make possible running matches with absolutely no delays, which was one of the causes of the rapidly dwindling turnouts in the past years in this area.

George Bjornstad
Chicago, Ill.

FURR UNDER HIS TAIL

Dear Phil:

I hope by this time you have your winter meat all packed away in the deep freeze. (Ed.—I have) All I have seen so far in my hunting was a couple of does, but doe season opens around here on the 22nd, for the last ten days of the season, when I hope to have better luck.

We are getting some wonderful reading these days from the several magazines devoted to shooting and firearms. Trouble is that most of what we read ISN'T SO at all. For instance, turn to page 37 in the Nov. 1959 issue of GUNS & AMMO, and at the top of the page in center column we read where Robert Hutton gives credit to Lysle Kilbourn for inventing the fire forming of cases. Here is the Hutton data, word for word. "Kilbourn, now with the Lyman Gun Sight Co., was the first to find that a standard cartridge fired in a chamber that was enlarged, would improve combustion."

The fact is simply that Kilbourn never saw a bottle neck Hornet case until he picked one up off my own work bench, and then asked what it was. He then had Risley, who chambered my own rifle. make up a rifle for him, and the K Hornet was born.

Now let's look at the record. If you turn to page 68 in the PRACTICAL DOPE ON THE 22, by Fred Ness, you read as follows: "Notable among these IMPROVED HORNET j o b s were those managed by Zoerb and Donaldson." This same information was shown in the RIFLEMAN some time BEFORE any K-Hornets appeared.

The trouble with the modern writer on shooting matters is simply this. So much was going on in this shooting business long years before the modern writers were born, that they never will catch up on what has gone before. We can hardly blame them for what they DON'T KNOW, but in the old days when a shooter sat down to write about his experiences, he put down in print exactly his own experiences, and did no guessing.

For the record; about the first shooter to fire form a case was A. O. Zischang, of Syracuse, N. Y., back around 1875. He took the 32 IDEAL case, pushed it into a die, having a long gradual taper to a smaller caliber, and fire formed it in his chamber. I have some of these formed cases in my collection. My own first experience in fire forming a case was back around 1894. When the 25/36 case (invented by Wm. V. Lowe), and later the 25/35 Winchester came out, the writer, living in a small town had trouble in buying ammunition. To get around this difficulty I simply necked down some 32/40 cases to 25 caliber and then fire formed them in my own rifle. But friend Hutton was hardly AROUND in those days. I will mail you one of these old 32/40 cases, just as it came from the die and before it was fire formed, so you can see what it looks like. Fire forming is a simple matter with **RIMMED** cases.

Now we again refer to Hutton's data. Note he says that Kilbourn wanted an improved chamber to IMPROVE combustion. The writer, after carefully testing out the bottle neck Hornet design, concluded that any improvement obtained was so small as not to warrant the new design, so I turned my attention to the design of my own 2-R Lovell case, having an abrupt shoulder. This was about the best of the long range woodchuck rifles, obtainable, and Col. Whelen told me one time the best accuracy he had ever seen from a chuck rifle, was from his own 2-R rifle.

The modern .222 Remington case is about like my 2-R design, but is rimless. No .222 Rem. will give a velocity of 3400 ft. Sec. with the 45 gr. bullet, but Ness reported this velocity in his own 2-R rifle (16" twist) from chronograph tests. I was getting ten shot groups UNDER a half inch, at 100 yards with my own 2-R rifle, many years before the modern bench rest shooting was born. J. Bushnell Smith, the Custom Loader, claimed UNDER one inch ten shot groups at 200 yards, with his 2-R rifle. Before his death he told me he was considering going back to this small case for his own bench rest shooting.

I would say it is about time some of these TECHNICAL EDITORS of the various magazines devoted to shooting matters should LAY OFF writing, for a while, and devote their spare time, if any, to EXTENSIVE RESEARCH. Man, could they USE this information?? When we read these magazines we have a right to expect the writers to know what they are writing about.

I'm not thinking about a few of us old timers who know the score, but of the many young shooters coming along, who are eagerly reading over all they can find in print about SHOOTING. If they have to depend on what is shown in ANY (note well I include ALL) of our magazines devoted to SHOOTING, they are in a poor way to learn much about the subject.

When we combine this lack of information together with the host of maximum loads shown in the several manuals on reloading, I wonder where and how it will end. In the old days we always worked UP to maximum loads. Now, it seems, the best way is to take the maximum load, and then WORK UP from there. You may say I'm always harping back to the good old days, but if you will turn back even fifty years and look through the old files of SHOOTING magazines you will find plenty of information that would help with present day shooting. This information is AUTHENTIC. If you are looking for fiction one had better read a magazine devoted to fiction.

Sincerely,
Harvey A. Donaldson
Fultonville, N. Y.

(Editor's comment: I think Harvey Donaldson is quite right in "setting the record straight," and I know that he has both the long experience and the reference material to do just that. He is certainly quite right in urging caution in hand loading and experimental shooting; that can't be repeated too often or emphasizd too much. But I do think he may have gotten just a little mite hot under the collar when he wrote the above letter. Very few people are **entirely** right all the time.)

"IT AIN'T NECESSARILY SO"

Dear Phil:

I was interested to see the comments in the November issue of "Precision Shooting" in regard to my letter on the test groups fired with the M-70 .308 Featherweight and the apparent fact that it shot better at 200 yards than it did at 100. Your comments are very well thought out and there is much truth in Mr. Bjornstad's remark that under certain conditions a rifle and ammunition may shoot smaller groups at long range, proportionally, than it does at short range.

Both of these things had occurred to me, but as related in my letter, I felt that the probable reason was simply chance. Further tests have confirmed that chance was the biggest factor, although you were correct that the warming up of the barrel did have an appreciable effect. Repeated tests showed that in this particular barrel the first three or four shots, starting with a cold barrel, were likely to be the extremes of the group and these shots were also likely to form a group about two to two and a half minutes of angle. It is often said that a light sporter is as accurate as a heavy barreled job for the first three or four shots or until it heats up, but "it ain't necessarily so." After this gun was warmed up the speed of shooting and continued shooting did not seem to make any difference, either in group size of point of impact. It will require further tests, but I suspect that there is a definite pattern in the impact points of the warming up shots!

Statistically, it requires a minimum of 30 shots to prove anything about the accuracy of a rifle-ammunition combination, and 50 shots is much better. Also, when using group sizes as a measure, the rifle-ammunition performance is actually being judged on the basis of only two shots out of each five, or in the case of the tests that I ran, 20 shots out of 50. Mean radius or string measure would be much more accurate and meaningful.

Five 5-shot groups at 100 yards averaged 1.69". This included one group which measured only .62". Five 5-shot groups at 200 yards averaged 2.85". If the test had been carried out with a greater number of shots or if mean radius had been used as a measure it is quite likely that the results would have corre-

(Continued on Page Eight)

CANTING FOR WINDAGE

By Jesse M. Grigg

Perhaps there are few shooters above the plinking stage who have not been taught that canting a rifle is a fault. It causes the bullet to deviate sidewise in the direction of cant, and to miss the mark by an amount which is in direct proportion to the "drop" of the bullet. The .22 LR bullet deviates a little more then twice as many minutes of angle over the 100 yard range as it does over the 50 yard. By coincidence the deviations due to wind over these two ranges are almost identical with those due to cant. The similarity in these phenomena thus suggests that the effects of canting may be turned to good account in compensation for wind, thereby making a virtue of what is generally considered a fault.

In scope shooting, however, there is nothing to be gained by canting, as holding over is easy enough. With iron sights, on the other hand, very few can hold over successfully; moreover, clicking as an alternative wears looseness in the sight, and what is perhaps worse, leads to confusion. The ideal solution therefore is found in canting, as it is easily and quickly done with as little likelihood of confusion as there is in holding over with the scope.

To pay off the canting must be done accurately, and this requires that a level tube be attached to the front sight so that it may be plainly seen while aiming. One method of attaching a level tube to a Redfield Olympic sight is illustrated in Fig. 1. The parts consist only of an easily made sheet metal frame, a level glass, a filling of plastic wood which holds the level and the entire assembly in place, plus a bit of paint, not all the paint serving as ornament. As the glass tube is a curved cylinder, a ray of light is turned by it something less than 90°; so, just forward of the bubble, the plastic wood is shaped into a table whose flat, top surface is painted white, this causing the bubble to appear in silhouette.

The ends of the sheet metal strip, which becomes both the frame and a

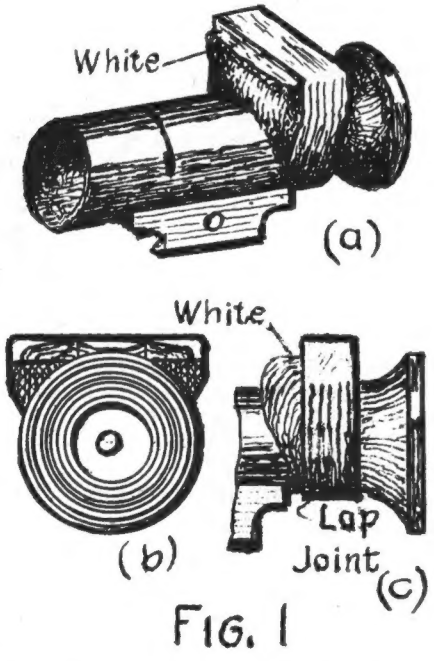


FIG. 1

shield, may be joined either by soldering or riveting. The level glass is of the type which is sold for the repair of mechanics' tools. It may be had for a song in any good hardware store.

The total angle of cant which the bubble will indicate depends on the length and curvature of the glass tube. Some indicate not more than 3° either way, others as much as 5°, but not less than a 5° movement in each direction is practical for the purpose here, and exactly this will prove more convenient. The range of the bubble in degrees is easily determined by holding the level tube against the side of a protractor and rotating them about a plumb line for an axis. A cotton thread and machine nut will serve for plumb-bob. Fingers will hold protractor and level in fixed relation. Symmetry is not required, as 5° is 5° wherever it is measured.

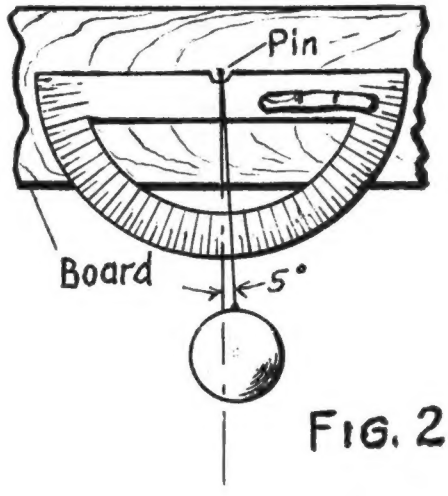


FIG. 2

Now for calculated deflections due to cant. If we use 1.25" for height of front sight aperture above bore center, 33" for distance between sights, add 1.25 minutes to 14.4 minutes (the 100 yard angle of departure for .22 LR 1145 f.s. velocity), then calculate the deviation for 5° cant we get 1.385 minutes deviation at the target. Similarly for 50 yards, add 2.5 minutes for front sight to 6.8 minutes for angle of departure, and we get for 5° cant .8105 minutes deviation at the target.

The deviations at the target due to a 10 mile cross wind are respectively .816 and 1.539 minutes at 50 yards and 100 yards. Thus the deviation for 5° cant very nearly equals the wind deflection at 50 yards, and fails of equaling the 100 yard wind deflection by only .15 of a minute. Wind deflections at a given range are proportional to wind velocity. If a whole bubble in the tube corresponds to 5° cant, half a bubble corresponds to 2.5°. Thus half a bubble instead of a whole will compensate for a 5 mile wind at either range, and so on for other winds. The rifle is leaned against the wind to offset its effect, just as one leans against the wind for steadiness.

The above figures refer to 1145 f.s. .22 LR ammunition. For low velocity loadings such as Mark III, the wind deflections are about 80 per cent of the above figures, but the angles of departure are slightly more. At this rate about 4° cant instead of 5° will correct for a 10 mile cross wind, and this should be kept in mind when low velocity ammunition is fired.

Now 10 miles an hour in the above computations does not need to be the actual wind velocity. It may be the difference of the present velocity from the average velocity. This means that one may hold the rifle level, sight in for average wind by clicking, and afterward cant for variation from the average. How much to cant still depends on the shooter's estimate of wind change, just as does holding over with the scope. But as 5° and 10 miles an hour are round numbers and common to both ranges, the system is easily remembered.

In moderate winds as in strong, I seldom shoot with the rifle level. The position of the bubble for which I have found the shots going in becomes my zero. After that I cant to right or left, half a bubble, a quarter, or whatever my bad judgment dictates. If there is just a whisper of wind I lean a little this way or a little that just for luck.

In strong winds the problems are different. Theoretically, as winds are said to vary about 50 per cent in strength and about 25 per cent in direction, the system is practical up to conditions where gusts of 20 miles an hour are encountered. But in wind shooting experience differs from theory. Long before the wind reaches 20 miles an hour its effect on the aim may so far exceed the effect on the bullet that doping becomes secondary to holding. In my own case this stage is reached when the wind roars in my ears. Whether or not the tremoring of the rifle may be detected, a shot fired then can go either right or left, depending on how the aim is disturbed. Thus for me the system ordinarily is dependable only when it is necessary to fire in winds not much exceeding 10 miles an hour. There are days of course when a wind may blow at 20 miles an hour and still not disturb the aim; then the system is good up to a full 20 miles of wind.

Honesty compels me now to state that the canting data shown above is based on a table of wind deflections which differs greatly from the table which is usually published for the .22 LR Standard velocity. It appears to me that the usual basic equation for wind deflection (called the Didion) is improper because it assumes that the sidewise acceleration is proportional to the ratio of wind velocity to projectile velocity. An assumption in this order would be warranted only if either the bullet or the air had both velocities.

As the atmosphere is composed of moving particles in constant collision, the sidewise component of the minus acceleration due to air resistance is proporitonal to the ratio of wind velocity to molecular velocity of the particles; or, in particular, is proportional to πW divided by $6V_m$ W being wind velocity, and V_m the molecular velocity which is 1654.5 f.s. at 68° F. and 29.92 inches of mercury, and not greatly different for related conditions.

This leads to the equation

$$(1)\quad D = 17.6\,W\left(\frac{\pi V_o}{6V_m}\right)\left(T - \frac{S}{V_o}\right)$$

where D is deviation in inches, V_o is muzzle velocity, T is flight time in seconds, V_m is defined above, and S in feet is the trajectory length over the range.

Over ranges of moderate length S may be replaced by the range length itself, and flight time will be given very nearly with

$$(2)\quad T = \frac{X}{V_0 - \frac{1}{2}(V_0 - V_1)} = \frac{2X}{V_0 + V_1}$$

where in feet per second V_0 is muzzle velocity, V_1 is remaining velocity at distance X in feet, both these velocities being found in catalog data.

Equation (1) above is the formula on which my table is based. It differs from the usual Didion equation by containing the ratio $\pi V_0/6V_m$. The last factor in parentheses stands for the "delay time." As thus amended, the equation yields progressively less than does the Didion when the muzzle velocity is less than about 3160 f.s. and more if the muzzle velocity is greater. Thus by coincidence of velocity, the usual Didion equation comes close for military projectiles, but fails dismally for the .22 rimfires.

As has been stated for the .22 LR Standard velocity (1145 f.s.) and a 10 mile cross wind, Eq. (1) above yields for 50 and 100 yards respectively .816 and 1.539 minutes. The yields for 5 miles an hour are half these figures, and twice as much for 20 miles. For a 10 mile cross wind Handbook on Smallbore Rifle Shooting shows 2.59 and 4.44 minutes respectively for 50 and 100 yards. If these figures were true, an uncompensated 20 mile wind would blow a bullet clear off the paper, an event I have never known to happen. A wind must indeed be strong, just to put a bullet out in the white, though often the sight line is blown that far over.

Tests for proof of various kinds equation (1) has come through with flying colors. The most elaborate and most conclusive of these was made with a falling cork sphere. As the fall distance (five feet) was pre-determined and the deflections could be accurately measured, and as accurately the striking velocity and delay time could be computed, the only source of error lay in the determination of wind velocities. These, however, were estimated by observing the angles of a calibrated string, and certainly one could not repeatedly err the 250 per cent that were necessary to condemn the thesis. Also, for each five miles of wind, the theoretical deflections had been previously computed; and, with these as radii, circles had been scribed about a plumbed-down center on a concrete walk. Thus the circle nearest which the falling sphere struck indicated the real deflection to the nearest five miles an hour. Conditions for the test were ideal, as the wind repeatedly changed in strength and direction from almost nothing to 18 miles an hour. All had been planned in hope for only approximate agreement with theory; yet, time after time, with unvarying faithfulness through widely differing winds the falling sphere struck so close to the predicted circle that these hopes were far exceeded. Not only were proved the calculations for the string, but also those for wind deflection.

At the same time there was an interesting sidelight on the test. This was a notable observation which I was able to make, because of knowing, from instant to instant, the velocity of an exceedingly changeable wind. Velocities above 8 or 10 miles an hour made no change of sensation on my face, this in accordance with the psychological law that sensation varies as the logarithm of the stimulus; yet the fact of greater velocity was manifested by a sense of greater thrust, by the way my hair was ruffled and my sleeves filled, and by the different sounds. Altogether it was a pleasurable experience, just to note the different signs, and know what velocities corresponded to which.

However, of all the simple signs which indicate wind velocity, perhaps those given by a flag are best. Early in the 19th century, when all vessels sailed under canvas, Admiral Sir Francis Beaufort cataloged them in a table which is now known as the Beaufort Scale. In miles per hour this table for wind velocity at level of the flag is:

4-7	Flag stirs
8-11	Flag opens out
12-19	Flag flaps
20-24	Flag ripples
25 31	Flag beats
32-28	Flag extends

But mere wind doping is not all it takes to excel. Even with the help of canting one should not forget that superior ability to hold and squeeze is largely what makes the difference between a good wind shooter and a poor. The scores of one who can just bark the 10-ring in no wind will suffer badly in any wind, whereas the 40 x shooter can ignore changes up to 6.5 miles an hour and still score a possible at 100 yards.

HARVEY DONALDSON WRITES ON RE-BORED RIFLE BARRELS

Dear Phil:

I sometimes wonder if the readers of our magazine understand fully the advantages of having a barrel RE-BORED to a larger caliber.

This is by no means a recent procedure, as way back in what we like to call the good old days, before 1900, the Massachusetts Arms Company advertised in SHOOTING & FISHING that they were prepared to re-bore barrels in 22 caliber for the Maynard rifles, to the then new 25-20 single shot caliber. The Maynard Company was the first to chamber barrels for this fine little case. The 25-20 S. S. case was designed by J. F. Rabbeth, and the first article I ever saw on this case was written by Mr. Rabbeth, and appeared in the April 18th, 1889 issue of SHOOTING & FISHING.

After the Stevens Company took over the Mass. Arms Co., they continued to re-bore most any barrel to a larger caliber. In the black powder days a 22 caliber barrel was soon worthless from improper cleaning, and this re-boring to a larger caliber gave the shooter a new rifle, at very little cost. All of which is as true today as it was sixty years ago.

I own and use several barrels that were originally .22 caliber, but have been re-bored to 6 m/m and .25 caliber. All of them have given exceptional accuracy. I dare say, standing in gun cabinets, all around the country, are plenty of good rifles with what their owners claim are shot out barrels. Now, it is quite a saving to have such a barrel re-bored, rather than have to pay for a new barrel, then having it fitted and chambered. With the re-boring job all that is required is a new chamber. The old barrel fits the stock, and no new scope blocks are required.

Now, I am coming to the best part of having a barrel re-bored to a larger size and that is the fact that the new job most likely will give far BETTER accuracy, than in the original caliber. It may be hard to explain just why this is so, but such has been my own experience. Now, let's hear what two real old timers had to say about re-boring a barrel. When visiting with Harry Pope, at Walnut Hill, in July 1938, I happened to mention one of his own re-boring jobs he had done for me, by boring one of my own worn out 32-40 barrels to 38-55 caliber. Harry said he figured the old barrel was CURED by shooting, and when re-bored to a larger size, one had a perfect barrel. He told me the most accurate 38-55 rifle he had ever made up was one he had rebored from a 32-40 caliber.

My correspondence from the late Chas. Rowland of Boulder, Colorado, that covered over 30 years, contains mention several times of where, when he had Schoyen re-bore and old barrel to one of a larger size, he got better accuracy than from the original caliber. He also claimed the barrels, after they had been fired for years, and then re-bored, took what he called a curing process, and thus gave better accuracy.

I will venture no opinion on this matter, myself, more than to say I never saw a re-bored job that did not give improved accuracy. Of course the two above old time riflemen were telling about accuracy obtained from the use of the old black powder Schuetzen rifles, but as both of them had made records that still stand, we might say they had some idea as to accuracy.

Some of you old time mechanics will know that when we have a casting that we want to CURE we bury it under ground, and leave it to rust properly. This works well in making a surface plate. I wonder if your readers will think I'm nuts when they learn I have a very fine worn out .22 cal. GREGOIRE barrel (after greasing the bore) buried out in the back yard for most ten years. One of these days, soon, I will dig it up and ship it to friend P. O. Ackley, Box 185, Murray, Utah, and have him re-bore it to 6 m/m caliber.

I guess you know I'm working on a new case design in 6 m/m strictly for bench rest shooting. Well, if the new case beats my own .219 or the Rem. .222 it will take considerable DOING, so I'm not passing up any bets that will have a bearing on accuracy, for the new design. SO, I will use a re-bored barrel.

The chances are that both Douglas and Clyde Hart are so busy making new barrels that they have little time for re-boring an old barrel. There are no doubt many gunsmiths all around the country tooled up for this work, and the reason I have mentioned Ackley is because I have had good reports on his work, in this line.

Sincerely,

Harve

HUNTING RIFLE TUNING KINK: The Remington 760 is, I find, one of our more accurate hunting rifles, when it is right. On several of these rifles that have not grouped well, I have improved them greatly by relieving tension upward on the barrel; this being done by shortening the collar between the barrel and tip of the forearm. Walter Cabell, Rutland, Vt.

COMING: Some dope on .50 cal. machine gun powder in over-bore capacity rifle cartridges.

AUTOMATIC TARGET TIMER

by William E. Peterson

"Whee-e-e" went the cease-fire whistle, and a concerted howl of protest came from the pistol firing line, as the last shots of the string went wildly down the range. "Well, maybe I did gyp you out of a second or two," said the range officer, "but what's a second? You all got your shots off."

Sure, a second is only a second, but in rapid fire it can mean the difference between a near-record and a mediocre score. The above episode, an actual experience, occurred with stationary targets, but it can happen just as well with turning or disappearing targets, if the fallible human factor is involved. What is almost equally reprehensible is to time the target turning a bit over-generously, to avoid all protest. This is not unknown in range procedure.

The only real answer is automatic target operation. At least that is what the members of the Woodstock (Vermont) Rifle and Pistol Club decided in working out the details of the Vermont State Pistol Tournament held at their range. The decision being easier to make as the club is fortunate in having among its officers one who besides possessing his full share of Yankee ingenuity, was an electrical appliance dealer. While this combination is not absolutely essential, it helps.

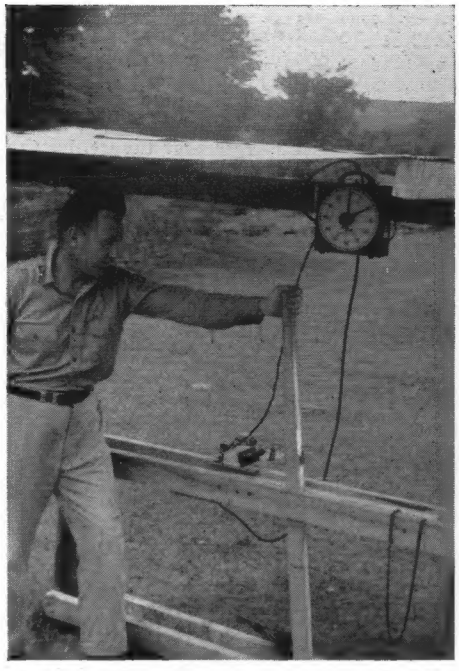
The basis for the contraption is an electrical clock and range timer made by Steiner Brothers, Inc., of 33-22 Northern Boulevard, Long Island City, N. Y. With this device the time to be allowed is first set off with a movable hand on the big 8-inch face of the clock. After the clock is started, the expiration of firing time is signalled by a loud buzzing, and the timer can also be wired to close an electrical circuit which may be used to flash red lights, or in the case here described, to actuate a release mechanism which allows powerful coil springs to pull the 36 pistol targets to the edge-on cease-fire position.

The only manual part of the operating cycle is the pulling back of the lever which extends the coil springs and exposes the targets at the proper interval after the command "Ready on the firing line." At the instant of full exposure, when the lever is all the way back, it trips the timer starting switch. At the same instant a latch engages against a steel plate on the front of the lever, holding the lever back until release. The instant the time expires, the timer closes a circuit energizing a solenoid, which is simply an electrical magnet with a movable internal member. The solenoid in turn pulls back the latch, the lever flies forward and the targets turn away. A neat little touch is the application of a door check to the bottom of the operating lever, which prevents slam as the targets come to rest.

All of which sounds quite simple, but required quite a bit of experiment and adjustment before everything worked right. For instance the solenoid used was not quite powerful enough to pull the latch back when connected direct, as the powerful coil springs at the targets caused a heavy "trigger pull." This was corrected by interposing a small lever between solenoid and latch. Some adjustment was also needed in locating the timer starting switch, which is thrown by the operating lever as it reaches the "cocked" or firing position. Finally, to avoid exposure to weather, it was considered necessary to arrange for the easy removal of the mechanism without disassembly. This was done by permanently locating the parts on a section of board, fastened to the main structure by two bolts. Ordinary manual target operation is used for casual practice.

The clock timer is mounted so that the face is at all times visible from the firing line and the area behind it, so that its setting can be checked by any competitor. In slow fire, too, when time permits, a glance will tell the shooter whether or not he has to speed up those last few shots. It is believed that the assurance of perfect timing, the ease of checking the setting, and the sure knowledge as to the passage of time as in slow fire, all combine to remove one of the psychological brakes on good scoring.

The complete outfit was relatively inexpensive, the clock timer alone costing $29.95 being the principal item. As this unit is providing perfect timing on the indoor range all winter, several times a week, as well as on the outdoor range during the season, its cost is more than



Charles Stimets of Woodstock (Vt.) Club, who devised and built this target release, pulls the operating lever back to expose the targets and start the timer.

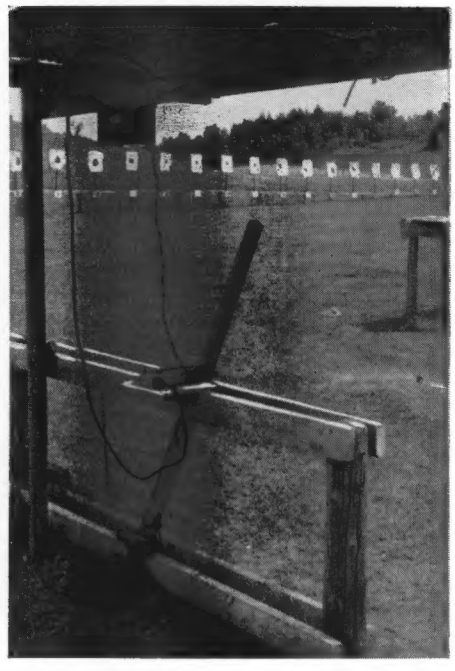
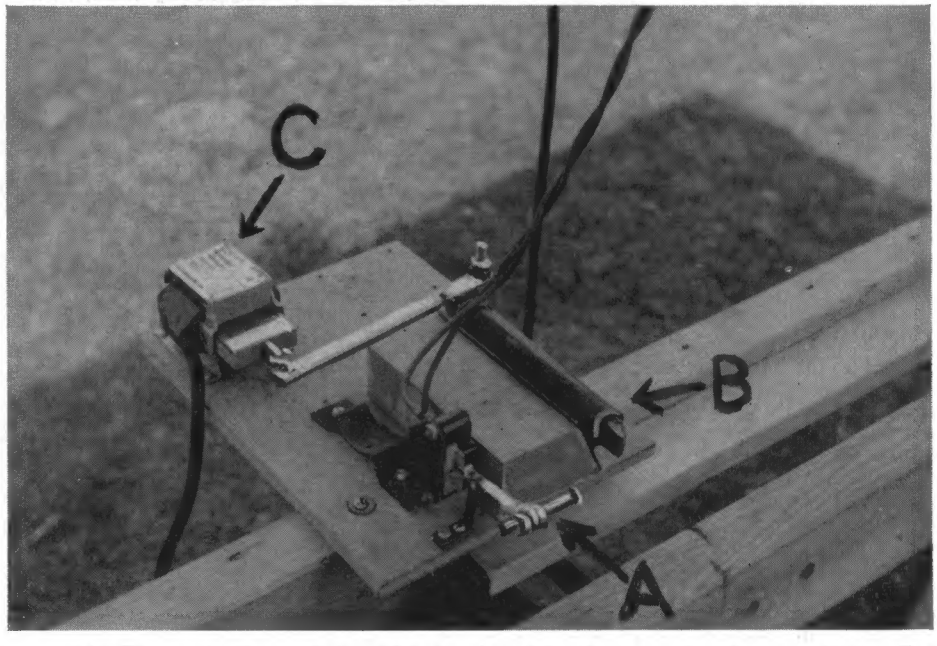


Photo taken from the reverse side, showing targets exposed and lever latched back in "cocked" or firing position. Note door check at bottom of lever.



(A) Timer starting switch which is tripped by the operating lever as it is pulled back to expose targets.

(B) Latch which holds the lever back for exposed target position during firing period.

(C) Solenoid, which is energized by current from the clock timer at the end of the firing period, when it pulls back the latch releasing the lever and permitting the springs to turn the targets away from the firing line.

justified. The rest of the equipment in this case came from scrap, and should be readily obtainable, while the electrical and mechanical skill required for assembly is usually available among the membership of most shooting organizations.

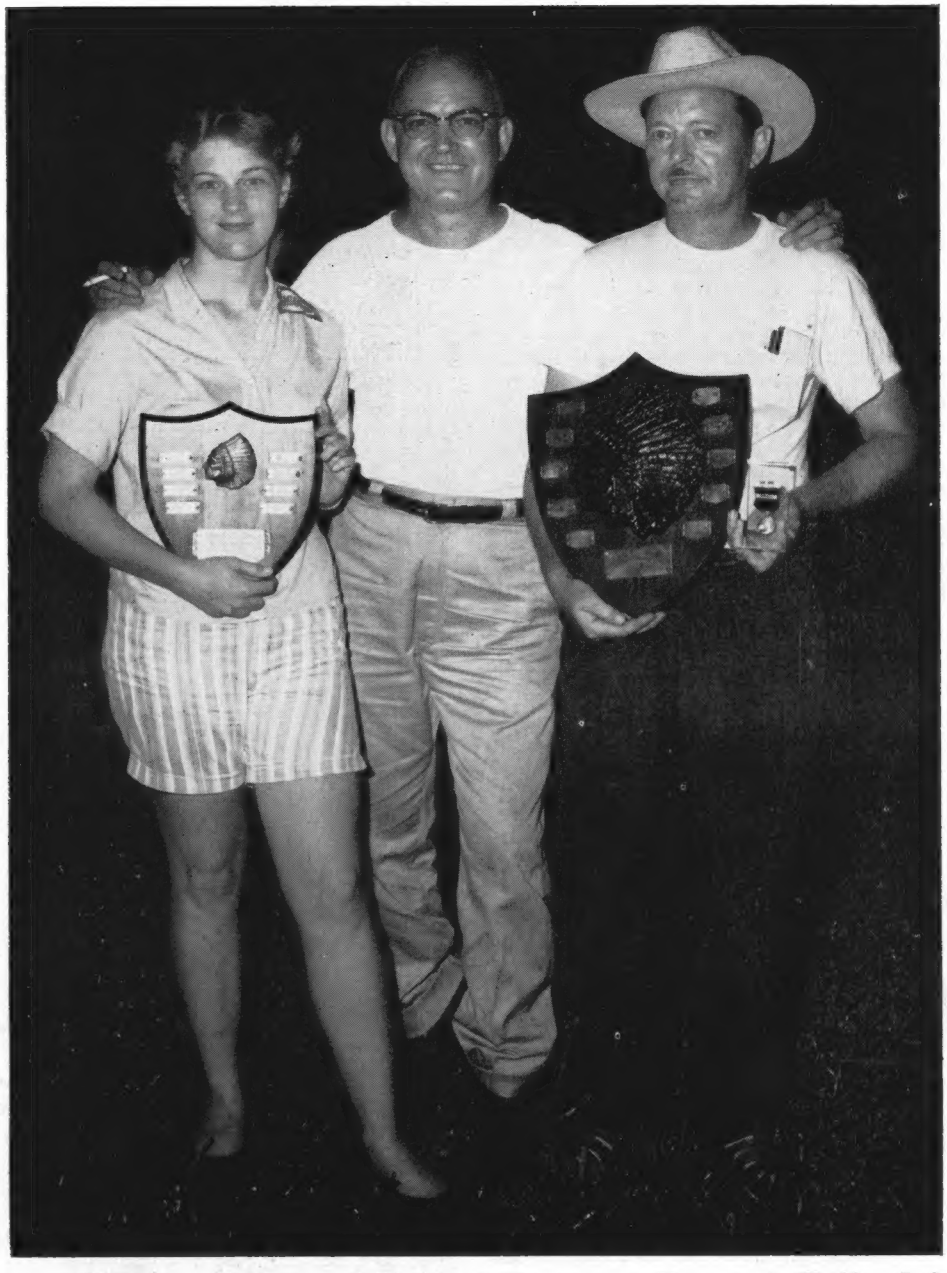
FLORIDA'S "BLACKHAWK TOURNAMENT"

The spotlight was on the Junior Class smallbore rifle competitors for both days of the Ninth Annual Blackhawk Smallbore Rifle Tournament conducted on Dr. F. P. Archer's Pine Tree Rifle Range in Homestead, Florida. Due to the limitations of Dr. Archer's small (8 covered firing points) but complete facility and to the large entry experienced in recent years, the tournaments conducted have been split into two successive Sundays; the Junior, Marksman and Sharpshooter classes firing one day and the Expert and Master classes firing the following week.

On November 1st ten year old Maury Morse of Miami dominated the Junior field in the first two fired events with 'scope sights, but when the iron sights were required it was the consistency of fifteen year old, blond and pretty Mary Kathryn McEvoy, who overcame Morse's lead to take the newly presented Blackhawk Junior Plaque as the Junior Champion in the grand aggregate. Kathy, a Jackson High School sophomore, with relatively little outdoor experience, used a borrowed Remington Model 37 and Mark III to provide her first tournament win.

In the Sharpshooter class, Paul "Tommy" Henderson left no doubt as to who was master of that field, taking five of the six matches. After a long lay-off, Tommy resumed his smallbore activity only a few months ago and after this performance it is quite evident he will not be a Sharpshooter long.

On November 8th the field consisted of 15 Masters and 3 Experts, including two Junior Masters, Billy Tourch (winner of the Blackhawk Open Trophy in 1958) and newcomer to the class, Miss Leigh Baxter. Both of these youngsters bucked heads with each other for the first three fired events of the day, firing identical scores, and in so doing lopped off the heads of many an old pro. However, pressure took its toll in the last match and reduced these young battlers to 3rd and 4th places in the grand aggregate, which was nevertheless quite some achievement in rather fast company. Wilson White won the aggregate with a 1595-116 over Dr. Archer's 1595-104.



Winners at Ninth Annual Blackhawk Tournament, Homestead, Florida. Left to right; Mary Kathryn McEvoy, Blackhawk Junior Champion; Dr. F. P. Archer, Jr., tournament sponsor; and Wlison W. White, Blackhawk Champion.

NEW JERSEY SMALLBORE RIFLE

The New Jersey Small Bore Rifle League held its individual "Victory Match" October 25th with 74 competing and a very even distribution in all classes.

Fred E. Triggs, Madison, was the winner with a 400-34x, followed by William W. Heil, Central Bergen 400-29; J. Eric Sundstrom, Roseland 400-25; Lewis M. Hazelton, Roosevelt (shooting iron sights) 400-24; and John A. Holle, Rose land 400-21—all five in Master class.

Winnie Carr, Roseland, was high Expert with 399-24; Carol Swendeman, Roseland, high Sharpshooter with 396-27; and Martin F. Glowski, Mohawk, high Marksman with 396-24.

OHIO GALLERY LEAGUE

The North Central Ohio League began its indoor season October 27th with seven teams on the roster. The course of fire is 10 shots each from the prone, kneeling and standing positions with any sights. Ashland fired a five man team score of 1433 in its first match, against Richland Casco. Ashland's second five scored 1388 and enough to beat Gasco's 1382. Galion fired 1405 in its first match to beat Myers' 1394. Galion's Dorothy Pfleiderer and Florence Rhinehart are consistent first string shooters.

SMALLBORE FREE RIFLE AT MURRYSVILLE, PENNA.

Three Marine Corps shooters and a squad from the Air Force matched shooting skill with the local civilian shooters at the Murrysville Rifle Club "Camp Perry Warm-Up Match" (50 meter free rifle) on August 1 and 2.

Marines J. E. Hill and E. D. Duncan took the first two aggregate spots; Hill's winning 1118-15 setting a new range record. Duncan shot a 1109-10. Civilians Barry Trew with 1107-24 and R. K. "Bob" Moore with 1098-14 took the next two places. Marine Lt. Frank Briggs and Air Force Capt. Richard F. Hanson were fifth and sixth with 1088-14 and 1082-8. A range capacity 24 shooters competed.

Barry Trew's 395-13 was high prone score and Hill's 393-11 was second. Hill's 381-4 was high kneeling and Brigg's 373-4 was second. Duncan had high standing score of 356 and Hill's 344 was second; Bob Moore had a 343 and Trew a 341.

Only 11 shot the Fall Free Rifle Match (smallbore) at Murrysville on September 19 and 20. Bob Moore beat out T. Y. "Denny" Wu by a point and an X—1113-15 to 1112-14. Bill Funk was third with 1086-13. Moore was high prone with 392-9 and kneeling with 377-6. Wu's 354-1 standing was high and very nearly caught up with Moore's 11 point lead going into that stage.

COMING: A report on an unusual method for lapping the bores of rifle barrels.

(Continued from Page Three)

lated more closely. As it is, and taking into account the actual factors of the test, it may be reasonably said that the results are within the limits of probable statistical error.

To go back to my original premise, any series of events, such as the firing of a large number of rifle shots at one aiming point or the throwing of darts at a board, will result in a definite pattern which can be predicted by the laws of chance and probability. The distribution, when charted, will result in a bell shaped chart and can be proven mathematically, as was done many years ago by a French mathematician named Chauvenet. Applied to the pattern of shots in a group having a sufficiently large number of shots to give correct statistical results, Chauvenet's table gives the relation between the size of the zone containing 50 per cent of the shots and zones containing other percentages. The zone containing 75 per cent of the shots will be 1.71 times as large as the 50 per cent zone and the zone containing 99 percent of the shots will be 3.82 times as large.

A circle drawn with the mean radius used as the radius and the mean point of impact as the center will contain 54.4 per cent of the shots, assuming the group is circular and not elliptical.

The above is from the "British Textbook Of Small Arms," edition of 1929, chapter VIII.

There is no definite relationship between mean radius and extreme spread, but competent authorities estimate that extreme spread will run three to four times the mean radius. Thus, generally speaking, a circle with a diameter of one half to two thirds the extreme spread will contain 54.4 per cent of the shots.

From this it may be seen that with the shooting of only two groups at 100 yards and two groups at 200 yards, groups of five shots and groups measured by extreme spread, that it is well within the realm of probability that the 200 yard groups may be smaller than the 100 yard groups. And, as humans, we are all likely to recall only the better groups when telling of the performance of our guns or, in our testing, to stop when we have fired a couple of good groups and consider these representative of the gun's performance.

This has been, perhaps, a rather long-winded explanation. I would also like to say that most bench rest shooters have a very good idea of the actual accuracy of their rifles, but they represent a very small proportion of the shooters and an even smaller proportion of the writers of shooting. It is scarcely possible to read any of the outdoor magazines today without seeing references to "less than minute of angle accuracy" in sporter weight rifles. Often these rifles are chambered for some overgrown cartridge developing thirty to fifty foot pounds of recoil and yet the author sits down at the bench, sights in for his hunting trip and in the process proves the minute of angle accuracy of his weapon. According to a recent article, which I am willing to accept as factual, the USAAMU at Fort Benning **is working toward a goal** of "a combination of rifle and ammunition that will **average** an extreme spread of 2½ inches at 300 meters for three successive ten shot groups." That is when shot from an accuracy cradle, using a 16 or 17 pound gun and the best ammunition that Fankford Arsenal or anyone else has been able to turn out in this country. Seems as though they must be far behind the times when most any gun editor has a cabinet full of sporters which weigh eight pounds complete with scope that will do almost this well from bench rest!

Best regards,
Creighton Audette
Springfield, Vt.

BARREL VIBRATION

Dear Phil:

In reference to the letter from Mr. Doak Criss in the October issue of "Precision Shooting," in which he questions the peculiar vibrations of his sleeved action and barrel, I would like to point out that the sleeve has nothing to do with the vibration, in my opinion.

The fact that there is no vibration near the end of the combination is based on the same law of physics which causes a baseball bat to sting our hands when the ball contacts it too near the handle or the end.

This "dead" point can easily be found by suspending the barrel with a cord at one end and striking it gently along its length until the point of no vibrations is reached, about three fourths down. Whether or not these conditions remain the same when the barrel is suspended horizontally and under shooting conditions, I have not had the opportunity to determine. This would be interesting to play with and I would like to see someone investigate it further.

Cordially,
John E. Warren
Eastham, Mass.

OUTSTANDING 1000 YARDS RECORDS

Dear Phil:

I noted the exchange of correspondence between Sam Tekulsky and Dermot Reilly in the November issue of "Precision Shooting," on the subject of 1000 yard shooting records. So far as I know from my reading, Sam does hold the record for the longest run of bulls at 1000 yards and a fine performance it was! I well remember the awe with which I read of his feat when it was written up in the "RIFLEMAN."

Long range shooting has always interested me and it is possible that some of the work which has been done at 1000 yards in years past may be of interest to your readers.

The dimensions of the present military "C" target have remained unchanged since 1875 (with the exception of the addition of the V ring) and it is thus possible to make a direct comparison of the scores fired over a long period of time. When the long range scores fired with black powder rifles and lead bullets in the late 1800's are compared with the scores fired in the last ten or twenty years I am somewhat inclined to agree with the opinion of those who claim that most of the advances in rifle shooting in the past fifty years have been in rapidity of fire and ease of reloading, not in increased accuracy. Certainly, compared with the tremendous advances in other fields, rifle accuracy has progressed very little.

In T. H. Freemantle's book "Notes on the Rifle," published in London in 1896, an account is given of the firing of fifty consecutive shots at 1000 yards by George C. Gibbs on October 11, 1886. The rifle was a Farquharson-Metford single shot match rifle in .461 caliber, using a 540 grain, swaged, paper-patched lead bullet and Curtis and Harvey's No. 6 powder. The gun was muzzle loaded, using a false muzzle, and was not cleaned between shots or at any time in the firing of the fifty shots. Iron sights were used, probably being of the extension variety, mounted on the heel of the buttstock, as the "back" position was in vogue for long range shooting at that time. It is stated the rifle was an old one which had previously been fired some 20,000 shots.

The score was 48 bulls out of the 50 shots, with a run of 37 consecutive bulls, the sixth shot being out in the four ring at six o'clock about three inches and the thirteenth shot out some seven or eight inches at four o'clock. The illustration of the target shows an excellent group, well centered in the bullseye. Probably half or slightly more of the shots would have scored V's on the present twenty inch V ring. This would be a most respectable score in an iron sight 1000 yard match today!

There are on record other 1000 yard scores fired in the late 1880's which prove that the score above, while a remarkable performance, was not just a stroke of luck, but we shall skip these and proceed to the National Matches at Camp Perry in 1921.

That year, the Washington Civilian Team had as a member a 61 year old shooter named George R. Farr. Farr entered the Wimbledon in the service rifle class, using the ammunition issued to him on the line. He proceeded to shoot a run of 71 consecutive bulls, going out on his 72nd shot as the light failed and it became too dark to see the sights and the bull clearly. Friends and other contestants purchased the National Match Springfield that he used and gave it to him as a present. No, he didn't win the Wimbledon. It was won by a young marine twenty-odd years old, shooting a telescope-sighted bull gun and match ammunition. His score? 75 consecutive bulls. Some of our present-day shooters who bemoan the troubles that they have in using aperture iron sights, and who shoot only in the scope matches, might take a look at the regular Springfield sights and ponder that one!

According to the "AMERICAN RIFLEMAN," the next long run at 1000 yards was shot by Gus Schwizer at Peekskill, New York in 1933. This was a run of 79 consecutive bulls, which with 2 sighters and a previous re-entry ticket gave an unofficial run of 86 bulls.

Then we have the superb performance of Sam Tekulsky at Peekskill in 1938 as mentioned in the November issue of "Precision Shooting."

After the V ring was added the days of long runs of bullseyes were largely over. Major Hession of Winchester fired a 19V possible which stood as a record for some time, in fact until after the advent of the .300 H&H magnum, which was first used in the Wimbledon by Ben Comfort in 1935. Along in the 1930's several men fired scores of 100-19V, with the record shifting about according to Creedmore rules, depending on the sequence of shots. It always seemed to me that Hession's score was a little the best of these as it was fired with a .30-06 and the others were fired with .300 magnums, which unquestionably have an edge at the long ranges.

The present record of 27 consecutive

V's was fired in the Wimbledon in 1939 by a marine named Wolters. To the best of my knowledge no one has come even close to beating this score in competition in recent years. In the same year at Perry, an eight man team of United States Marines won the Herrick Trophy Match with a score of 800-124V.

Now, if we are honest and frank about it, any of these exceptional performances at 1000 yards are made only when conditions of wind, weather and mirage are very good. Freemantle's report of Gibbs' performance states that the weather was very favorable with only a slight drift of wind and a steady light, not too bright. Farr's score, since the failing light is mentioned, must have been fired after sundown, when conditions are generally very good. As I recall the account of Sam Tekulsky's shooting at Peekskill, during the last of his shooting he was allowed to use two adjoining targets, as the light was failing and this was permitted so as to speed up the shooting. My own score at Albany, although I do not wish to infer that it compares with the others mentioned above, was shot late in the afternoon when conditions were very favorable. In these circumstances the things which the rifleman can take credit for are steady holding and clean, consistent letoffs. Superior skill may be evidenced by another shooter in the middle of the day when wind and mirage are constantly shifting and yet his score may be several points lower.

With the best of bull guns and ammunition it is doubtful that grouping possibilities at 1000 yards are better than an average of 15 to 20 inches. Mathematically, it takes an overall wind change of something like four miles per hour to move the .30-06, 180 grain boattail from the center of the V ring out to the four ring. With the .300 magnum it might take a five or six mile wind change over the complete range. You have to wet your finger and hold it up to feel the direction in which a four mile wind is blowing. With mirage running it is a bit easier to estimate wind direction and velocity in light breezes. If your errors of wind estimate, holding and letoff happen to coincide with the direction of that particular shot within the normal grouping of the rifle and ammunition—look for it in the three ring!

Best regards,
Creighton Audette
Springfield, Vt.

CORRECTIONS

In September we incorrectly listed John W. Hurst, winner of the .22 cal. aggrgeate at Camp Perry, as from the Detroit Police. He is a member of the Los Angeles, California, Police Force.

In October the caption of the photo of the anti-ricochet backstop would indicate a Police owned range, which is incorrect. The range is owned and operated by the Westchester County Police Revolver and Rifle League, which is an independent League with membership including BOTH members of the Police Departments in Westchester County, New York and civilians in the same area and, we believe, in adjoining Connecticut.

COMING: Another Jesse M. Grigg article titled' "ARTIFICE IN IRON SIGHT AIMING."

JUNKER---World's finest shooting glasses, **designed** for rifle shooting, very definitely needed by older men for metallic-sight work.
Frames only, **$18.50.** With non-prescription lens, **$22.50.**

ANNOUNCEMENT
Beginning January 1st, 1960, I will begin wholesaling to a selected dealer list a number of arms and accessories—Walther, Anschutz, Gehmann, Junker, Unertl, etc. Responsible established shops serving the competitive shooting public are invited to write for lists. No part-time letterhead gunsmith inquiries, please.

ROY F. DUNLAP, **2319 Ft. Lowell Road, Tucson, Arizona**

MICRO-LUBE BULLET LUBRICANT

Lubricating bullets is usually something of a messy job. In some tools it is difficult to keep the lubricant feeding just fast enough to fill all lubricating grooves in the bullets, while at the same time avoiding excess lubricant squeezing past the die or adhering to the base of the bullet, requiring the wiping of every bullet base to prevent incomplete ignition of the powder charge.

Micro-Lube bullet lubricant seems surprisingly free of these common difficulties. The literature of the manufacturer states that "Micro-Lube is not sticky or messy and will not gum up your lubricator or loading equipment." In the experience of this reviewer, using an Ideal lubricator, the statement is quite true. Bullets came out clean, with grooves fully filled but no excess lubricant to build up in the nose of the bullet seater to cause too deep seating of the bullets, or constant dissembling of the plug to clean it out. This happy condition would seem to be the result of careful working out of the proper degree of density or firmness in the lubricant, although the materials used in the compound may have a bearing on it.

As to lubricating qualities, over a hundred bullets in which Micro-Lube was used, performed right up to standard. The manufacturers quote the results of a test made by Twining Laboratories of Fresno, California, in which is stated that the metal particles in the residue left in a barrel after firing bullets using Micro-Lube, was 53.4% less than with other lubricants used. This would seem to indicate less wear and a promise of longer barrel life.

Micro-Lube is supplied in stick form, both solid and cored, at a price of 55 cents per stick, with generous jobber and dealer discounts, by Dircks-Beath, Inc., Las Cruces, New Mexico, and Visalia, California. It is part of a complete line of reloading components, including bulk bullet metal of approved composition, as well as cast bullets. Sample bullets received—.38 and .45, in both target and service types—had a beveled base which enabled easy slipping of the bullet in the lip of the case and required less expansion of the lip than with square base bullets, thus lessening the incidence of splitting at the lip due to fatigue. The dealer price quoted on these bullets was $9.25 per thousand for .38 and $13.50 for .45.

William E. Peterson

HUFNAIL BULLETS

Specializing in custom hand swaged bullets in calibers .22 through .30 that are not available from any other source, to the best of my knowledge. Write me about your needs and your particular bullet problems.

D. B. HUFNAIL
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SHOOT! "Harvey Jugular Jacketed" & "Harvey Prot-X-Bore" Zinc Base Swaged Handgun Bullets.
Moulds, Swaging Dies 38, 357, 44 cal. & 45. .224 Kay-Chuk Handgun Conversions, of S&W K-22, Combat & M. R. F. Send 25¢ in coin or stamps for complete information.
"R"

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VARMINT AND SPORTER RIFLES FOR COMPETITION

Since the 1959 annual meeting of the NBRSA Directors, and the publication of some changes in the specifications for Varmint and Sporter class rifles for NBRSA competition, I, as NBRSA Secretary, have been receiving complaints and objections to these changes from some NBRSA Eastern Region shooters. The following excerpts from a letter received from Crawford H. Hollidge may serve as typical of the objections and as a basis for comment.

"I am glad to see that we finally recognize the fact that 10 shot matches have no place in the Varmint Rifle competition, but I am greatly discouraged at the decision of those who approve the change to a 3 inch wide fore-end and increase the weight a half a pound for every category. This opens wide the use of baby bench rest rifles in the Varmint matches, and if we continue to edge up the weight limits and size limits, little by little, we drive shooters from the game, and particularly incense shooters who have made up rifles at considerable expense to keep them within the early weight limits. It certainly must be assumed that a half pound addition was only to please some few shooters because the majority of Varmint shooters in my opinion would not have voted aye for such a move.

"The sad part of it is that I haven't found a single Varmint shooter within our ranks that has been asked for this recommendation, but then I don't know all of the fellows and maybe my opinion doesn't count, but I do know a lot of fellows who have shot in Varmint competitions in the Eastern Regional matches. Some of them were on the advisory committee to the President and I can't find anybody among them who would have been in favor of the increase approved by the directors."

Let's consider some of the above points, with, perhaps, some side-line comment.

Perhaps you will note that the above rather confines itself to the NBRSA Eastern Region, without regard to the other NBRSA Regions and the Directors which represent the NBRSA members and competitors in those other Regions. This is somewhat typical of a feeling of some Eastern Region members that the Eastern Region **IS** the NBRSA. That is very much in error. Actually, the Eastern Region representation on the NBRSA board of directors is a minority. Policy decisions of the NBRSA board of directors are made after due consideration of what is believed good for the whole NBRSA. Any proposals for policy change made between face-to-face meetings of the Directors are submitted by mail to the directors of all regions and decisions are made by majority vote of the directors. The directors from the various regions are sincere people trying to honestly and fairly represent the members in their own region, as they know the wishes of those members. There must be give-and-take in reaching decisions for the whole NBRSA, and there is. There is no skullduggery among your representatives on the NBRSA board of directors. Minority groups are a normal and desirable feature of any organization, but they should sell their point of view on its merits.

Specifically, the decision to increase the weight and the stock dimensions for the Varmint Rifle class competition was reached after it was brought out that some few over-the-counter factory rifles, commonly used for field varmint shooting, exceeded very slightly the old weight and dimension eligibility for competition. The specifications were liberalized to make those factory rifles eligible without alteration.

The objective in target shooting competition is to win matches. In every type of formal, organized target shooting that I know of, even those that were originally intended to offer training and practice for field shooting, the weapons used have tended to become highly specialized for the purpose required, and rules have been liberalized to permit that specialization. SKEET for shotguns and the International Running Deer competitions are outstanding illustrations of the weapons specialization. That specialization does drive some original competitors out of the game, but it also attracts some others. The weapons specifications for Varmint Rifle class bench rest competition have from the start invited custom built, specialized weapons. Whether we like it or not, that trend will probably continue, and I do not think it is imcompatible with the basic objectives of bench rest shooting.

Of the total number of **real riflemen** in the country, only a relatively small proportion participate in any form of organized competitive target shooting, though most of the non-participators own and use rifles of superior accuracy. Many of them use the bench rest for some or most of their test shooting. Undoubtedly most of them do follow the results of target shooting competitions, and from that and the discussions of the competitive shooters regarding arms, ammo and technique, gain information that they can apply with benefit to their own shooting. Those non-participators in formal rifle competitive shooting are a great deal more interested in reports of the shooting, and equipment used, than they are in the internal squabbles of any shooting organization, and we suspect that is true for many of the participators in the competitions, as well.

In conclusion, those parts of shooting rules and regulations which govern the specifications for permitted arms deal wtih maximums and minimums permitted. Within those limits, the competitor has considerable freedom of choice for what he will use. The true sportsman will stay well within both the letter and spirit of those limitations. On the other hand, the "gamesman," for whom the winning is the sole objective, is all too prone to crowd the letter of the rules limits to the very "stepping over" edge. Fortunately, in all the types of competitive shooting that I am familiar with, the sportsmen outnumber the "gamesmen" by a wide margin.

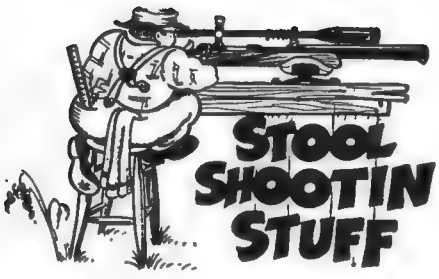
P. H. Teachout

DATES FOR THE 1960 NATIONAL CHAMPIONSHIPS

Dates for the first NATIONAL VARMINT AND SPORTER RIFLE BENCH REST CHAMPIONSHIPS have been announced as August 18th, 19th and 20th (Thursday, Friday and Saturdya). The matches will be held at San Angelo, Texas and will be sponsored by the Texas Bench Rest Shooters Association. Details in regard to these matches may be obtained from: Mr. F. L. Magoon, Box 909, Kerrville, Texas.

The NATIONAL BENCH REST RIFLE CHAMPIONSHIPS for unrestricted bench rest rifles will be held on the John Zink Range near Tulsa, Oklahoma. on August 23rd, 24th and 25th (Tuesday, Wednesday and Thursday). These matches will be sponsored by the Tulsa Bench Rest Rifle Club and details may be obtained from: Mr. E. A. Anderson, 3604 South Toledo, Tulsa, Oklahoma.

The dates for these two championship events have been arranged to make it possible for a competitor to attend **both** championships within a two week vacation period. They also make it possible for families with children of school age to include one or both championship shoots in a two week vacation trip schedule and be back home at least a week before the opening of school after Labor Day, even for those families who may travel quite long distances.



STOOL SHOOTIN STUFF

Dear Phil:

I was glad to see some more pictures used in the October issue. The one on the cover wasn't quite sharp enough to stand the magnification required but after all, we can't expect to see details as sharply as we could if we were looking through our spotting scopes.

The pictures of Gottschall, Yockey and Bob Hart were nice and sharp and aid the readers who never met these fellows to visualize them a little better.

Another feature which I enjoyed in the last issue was a reprint of some of the letters which you have received. It shows that the fellows are interested enough in the subject to write in and in one way or another add to the pot of knowledge which we develop as we follow the game. I think you were right in your policy of printing letters that are both for and agin some of the subjects.

It has bothered me on several occasions in the past to hear shooters say that they felt that the attitude of the magazine was slanted. This reaction is one to avoid if possible and although every person must be inclined one way or another, it's a rare person who has a clear and correct view on every subject. Many of the readers have years of experience to draw upon in their opinions or conclusions. However, even the eldest of the shooters must recognize the fact that new things come up at nearly every match and as much as they like to think of the old days as being good, they must recognize the fact that we really never had it so good as we do now when it comes to precise shooting. Never were there so many good barrels made or methods available for making them, and its' particularly true that we now have devices for testing the barrels that prove they were superbly manufactured. The primer and cases and bullets and powder are all superior to those of earlier days and if we don't improve the technique as we watch the methods of the best shooters, we are certainly not keeping abreast of the game.

The previous paragraph about letters received reminds me of one that I recently received from a fellow in the St. Louis area and one which might call for a little comment because in it he points out some facts that I think have a little weight at the present day.

We have noticed the drop in attendance at the shoots and often commented upon the fact that new shooters show up very infrequently in spite of the efforts of some of us to try to interest more in the game.

The writer from St. Louis points out clearly, and certainly not caustically, that some of the trend away from the heavy bench rest shooting is caused by the development in the game itself. He feels that to a large extent the bench rest shooting accomplished its original mission and obtained for the shooters greater accuracy than ever achieved before, and he feels that all of the things learned now should be utilized in a very practical manner.

He certainly points out that the bench rest rifle is about as impractical as a crossbow for anything other than what it was intended for—merely to prove the point that rifles can be made to hit a very small mark. With the developments of rests, they have become less attractive to him and he and most of the members of his club have now set their rifles aside because they have lost their enjoyment in shooting them for the types of competition that we foster.

Has he not struck a very important note and should we not put more energy into a more practical rifle. Col. Whelen long ago tried to get us to bend our efforts towards developing more interest in lighter rifles and I must say that it gives the writer a good deal more pleasure to get a small group out of a light rifle than it does several very small ones in a row from one of the heavy jobs.

All of the above impresses me because I know that lots of fellows are buying and making up rifles that are very accurate, most frequently used for Varmint shooting, but often used competitively for target shooting. This great group of shooters is not on the rosters of the BRSA and I frankly feel that most of them never will be unless we stop some of the nonsense that goes on.

I am glad to see that we finally recognize the fact that 10 shot matches have no place in the Varmint rifle competition, but I am greatly discouraged at the decision of those who approve the change to a 3 inch wide fore-end, and increase the weight a half pound for every category. This opens wide the use of baby bench rest rifles in the Varmint matches, and if we continue to edge up the weight limits and size limits little by little we drive shooters from the game, and particularly incense shooters who have made up rifles at considerable expense to keep within early weight limits.

Well, Phil, the bench rest season is about over in the Northern and Eastern areas of the country and most of us have given the rifle a good scrubbing and set it away until it's time to break it out again in the Spring. It's a pretty good idea to store the rifle carefully. As heavy as the stocks are they can acquire a set if they are stood in the corner with a half dozen other rifles resting against them. It's probably best to store them in a horizontal position akin to that used in shooting them. Before you do it you might consider loosening up the action screws just a wee bit and if you have a free floating barrel it might be a good idea to slide a few folds of paper in between the barrel and stock. This latter step is a good one when transporting the rifle a long distance.

I am not going to be able to get this story to you in time for the dead line as I have to get to Maine again and help get that "Buck Busting" shoot organized. We have a lot of fellows scheduled to come, not all of them benchrest shooters but they are good fellows and will fit in well with the group.

Well, Phil, here we are almost ten days later than the preceding, and the "Buck Busting" contest is over. We had a wonderful time but the bucks we busted were in the form of legal lettuce instead of running around with horns and hide. There were deer in the country. Some of the fellows would drive out night after night and see a dozen of them along the roads in their headlights, close to our hunting areas. On the opening day, almost everybody saw a deer or the tail of one, but when night came, we didn't have any to drag in.

Some of the lost shots were just clean misses but several of the bucks owed their lives to the fact that the benchrest shooters had been paying so much attention to their heavy rifles, they neglected to clean the heavy grease out of their firing pins and actions. The cold weather caught them flat footed and there were several cases of misfires that allowed the deer to get off with hardly a scare. I really can't speak for the way the deer feel on such an occasion but I can speak for the way a hunter feels because it happened to me back in 1941 when I unexpectedly got a few days hunting leave after having packed my gun in heavy grease for what I expected to be a long war. On that occasion, I had been following a good buck track on a well used run that was evident because of about 1" of nice tracking snow. I came to a beautiful birch glade and held up for a minute as I looked things over to make sure that a buck wasn't in sight or coming into view as he crossed an alder swale. I suddenly heard a click of antlers on the alders and expected the deer to come in sight on the far side of the alders. To my surprise there soon appeared running toward me, back on the tracks which I had been following, not the big deer I had expected but a small spike horn. I guess he was one of the "foolish ones" because he continued to run right towards me and much to my surprise started to feed 12 feet away. I hesitated about taking him but decided to and first held on his chest. I then thought I would be spoiling too much meat and changed the hold to the back of his neck as he fed on the path. The click of the firing pin surprised both the deer and me but he was alert enough to get away before I got a second shell into the chamber, and that's how I know how one feels with a gun full of cold grease, even though I had wiped mine out pretty carefully except for the main spring and firing pin.

All told, there were eighteen of us including the two guides and we should have gotten more deer, and we didn't win all of the prizes at a local turkey shoot which they held on Sunday either, but we did have a good time.

I did get a good buck on the second day of a hunt a little later in the area above Baxter State Park.

Cordially yours,

Ernest Stuhlschuter

DON'T TAKE IT FOR GRANTED: Don't accept for use any load data published in ANY periodical until you have checked it against commonly recognized safe loading data. Typographical errors can be missed by proof-readers, especially if they may not be familiar with shooting (which many are not). Even published maximum loads in recognized load data tables may be over-loads in certain arms and under certain circumstances. **BE CAUTIOUS** and stay healthy in all your handloading.

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BENCH REST MATCH RESULTS INDIANAPOLIS, INDIANA

The Mid State Shooting Club held its first bench rest match on its new range with ten benches under cover at New Palestine, Indiana, 15 miles east of Indianapolis, on November 1st. Here is how the club Vice President, Lowell Welch, tells the story of this first venture:

"Certainly, we had a wonderful bunch of fellows here. One could not hope to find a nicer group anywhere.

"I hardly know whether to tell you our shoot was the world's greatest bust or a tremendous success. It all depends on how you look at it. From the standpoint of attendance, I'd say it was a great success. Thinking of the consequences of our ignorance and lack of experience—nothing could be worse.

"There were thirty who got to shoot, and I'd say there were that many more who didn't unload their equipment. We got less than half-way through the program. Many saw the situation and just didn't make bad matters worse by further slowing things down.

"The trouble was we had more shooters than we anticipated and we undertook more of a program than we could possibly complete. Our lack of information and total absence of experience caught up with us and plagued us all day. We measured the last targets by car lights. Things moved just too slow and our errors of commission and omission were bad.

"You see none of us own a bench rest rifle and none of us had ever attended a match. We did use sense enough to admit our greenness before we started. We charged no regisrtation fees and coffee was on the 'house'. We let the shooters determine their own match fees. We just wanted them to have a good time.

"What they thought is debateable. Whatever their beefs and gripes they kept to themselves. Many were gracious enough to tell us we did well enough under the circumstances.

"The fellows were wonderful. Ted Holmes drove over 300 miles and never fired a shot. He measured targets all day and then wouldn't take a cent. Unbeknown to us, Ferris Pindell took up a collection to help defray the expenses. When he brought it to me I tried to get him to give it back. He simply said he didn't know who all gave nor how much, so he couldn't give it back—he then just laid it down and walked awa.y Although the coffee was supposed to be free virtually everyone laid down a dime when they took a cup.

"I must say that all of us agreed that we had a wonderful bunch of fellows as our guests."

Five shot matches were fired with both unrestricted bench rifles and Varmint rifles. Twenty fired the unrestricted rifles at 100 yards, and seventeen fired at 200 yards. Match winners at 100 yards were: Ferris Pindell .240″; I. E. Potter .340″; James Shepler .315″; L. S. Rucker .285″; and Al Roberts .205″. Aggregate winners were L. S. Rucker .361; Ferris Pindell .438; and Ernie Detmer .500.

Match winners at 200 yards were: Cline Deere .585″; Ernie Detmer 1.025″; Pete Chagares .715″; Ernie Detmer .520″; and Cline Dere .480″. Aggregate winners: Ernie Detmer .429 m.o.a.; Cline Deere .431; Pete Chagares .475; and Floyd Gibson .477. High in the two

The firing line of the Mill Creek Rifle Club near Kansas City, Kansas. There are five enclosed benches in the center section for all year, all weather shooting.

range aggregate were: Ernie Detmer .465 moa; Cline Deere .468; Ferris Pindell .476; L. S. Rucker .500; and I. E. Potter .539.

Fifteen shot the five Varmint Rifle matches at 100 yards and the winners were: Leland Cooper .232"; Jesse Sarrah .549"; Al Roberts .505" and .437; and Pete Chagares .450". High aggregates were: Al Roberts .606; R. D. Campbell .815; and L. S. Rucker .885".

KANSAS CITY, KANSAS

The Mill Creek Rifle Club held its first registered bench rest match on its new range near Kansas City, Kansas, on October 24th with 13 shooting the National Match Course with unrestricted bench rest rifles. The five high in the aggregates were:

	100 yd.	200 yd.	NMC.
H. G. Baucher	.386 (1)	.557 (2)	.472
Ted Holmes	.400 (2)	.570 (4)	.485
E. R. Carson	.421 (3)	.557 (5)	.499
Henry Barton	.422 (4)	.606	.514
Larry Engelbrecht	.497 (5)	.556 (1)	.527
Henry Sloan	.497 (5)		
Dixon Herman		.561 (3)	

Ted Holmes shot small group at 100 yds.—.260" and Bud Carden shot small group at 200 yards—.680".

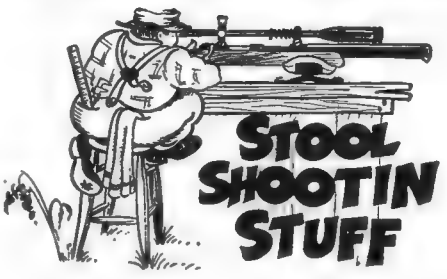
H. E. Powers from Okmulgee, Okla., who leans to the .220 Swift cartridge for varmint shooting, shot in this match a .220 in a 28 lb. gun with Douglas barrel with a rather unusual and stiff load of 41 grs. 4831 powder and his own 55 gr. bullets. He didn't win anything, averaging .673 at 100 yds. and .758 at 200 yds., but perhaps did demonstrate the worth of the .220 and the slow 4831 powder for field shooting accuracy.

THE NEW RANGE: After the 1958 National Shoot at Tulsa, the Mill Creek Rifle Club leased their present range site from a shot gun club who owned the 80 acres, located one half mile east and one fourth mile south of south junction of highways 7 and 10. With all club member labor, they have built the fine, modern bench rest range in less than a year. The cover photo this month illustrates the over-all attractiveness of their range, and the other two photos illustrate details of their excellent firing line of 15 benches, and the special feature of the five enclosed benches for all-year, all-weather shooting in comfort. They also have a pistol range which is used by the Johnson County Sheriff Patrol.

A PISTOL SHOOTING FRIEND

rather ridicules the editor for inspecting and cleaning the primer pockets in rifle cases at each reloading, yet he weighs and segregates cast pistol bullets to promote accuracy. I wonder if a quarter grain variation in weight of a 150 to 200 grain pistol bullet is more detrimental to accuracy than possible built-up fouling in a primer pocket which may either cushion the primer or cause it to be partially crushed in seating?

Four of the five enclosed benches on the Mill Creek Rifle Club's range near Kansas City, Kansas.



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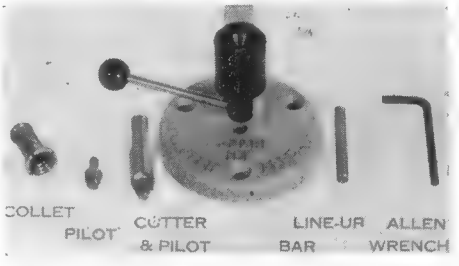

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THE INFORMATION BENCH

Question: For several months now I have considered building a benchrest rifle using the Winchester high wall action. I know that this was a popular action ten years ago for bench rest competition, but it couldn't hold its own against the bolt action rifles. It seems to me that this difference in accuracy was largely due to the two piece stock which is found on all Winchester high walls. It is my idea to mount the Winchester high wall on a one piece stock with the barrel full-floating. I'm sure that such a stock can be made as I have all the details worked out on my drawing board. Also, the method of attaching the action to the stock will be altered to make a more rigid connection. Do you think I'm wasting my time working with the Winchester high wall as a bench rest rifle? John Hautzinger, Box E, Troy, Montana

Answer: It is possible that you might have obtained a benchrest action easier than to adapt a Winchester high wall. However it certainly would not be impossible to make one shoot as a bench rest action and you are only wasting your time if you think that the final outcome will not be good.

I used a Peabody-Martini action on a bench rest rifle to take fifth place in the aggregate at Johnstown in 1950, I believe. This action was used purely to prove the point that the single shot action is as good as the bolt action if properly set up. The method of fastening the action to the stock of course is the main problem. All you have to do is fasten the action to the stock so that it assumes the same position relative to the stock for each shot. This is oversimplification as you must realize that a lot of work may be involved in obtaining this situation. M. H. Walker

A REPORT

Dear Mr. Walker:

Possibly you will recall along last spring I wrote you about suitable loads for a short barrel 30 06. You very kindly wrote me your recommendations.

Since then I have cut the barrel on my model 721 30-06 to exactly 18". I have tried several different loads but found the 4320 worked out pretty well. Possibly some others would be better but 4320 gives me a good job and quite good accuracy.

My friend, B. E. Hodgdon, ran the loads through his chronograph and the figures quoted are for average of three cartridges of each load. The results were as follows:

51 grains 4320 and 180 grain bullet—average 2,593 feet per second.

55 grains 4320 and 150 grain bullet—average 2,892 feet per second.

57 grains 4320 and 125 grain bullet—average 3,009 feet per second.

For a comparison, G. I. ammunition with 150 grain bullet clocked 2,511 feet per second out of this 18" barrel.

With the 4320 the accuracy is just under 2" at 100 yards and rather surprising the muzzle blast is not too objectionable. I have made up a special scabbard for the rifle and it sure is a handy one to hang on a saddle.

Again, my thanks and kindest personal regards.

George T. Chandler
Pratt, Kansas

Question: I'm afraid I'm going to be pestering you with questions for quite some time to come. I finally decided to forget my pride and ask the experts.

I have been involved in bench rest shooting in some form or other for the last 15 years. My interest has increased in the last couple of years to the extent that I have set up my own shop so I can do my own barrel turning and fitting. I have spent many hours performing all kinds of experiments and research and I think I have a pretty good running knowledge of the main factors concerning and effecting accuracy. I try to keep up with all the latest information that is published regarding the subject but the best results I've been able to obtain were with a .222 cal. using a heavy Schultz & Larsen action with a heavy laminated stock and a 25X Unertl target scope. The whole setup weighs about 22 pounds. I was able to average just under ½ inch but that accuracy only lasted about 3 or 4 hundred rounds. I have a Hart barrel ordered and a set of Biehler and Astles dies and figure on using the heavy Schultz & Larsen action.

My first question is—could someone enlighten me on about a half dozen major factors to employ in the making of this gun and getting it to shoot. Please list them in the sequence of their importance. My second question is—I've been playing around with trying to get a .219 Don to shoot with no success. I mounted a heavy barrel on a standard FN action and tried the barrel full floating but I imagine the action is not rigid enough. Can this setup be made to work satisfactorily with some kind of bedding device? When they use the FN action on the .219 do they alter the bolt and still use the rim of the case to determine head space or what? Am I right in thinking that a full floating barrel mounted on a rigid action is the best in the long run? My next question is—I have tried fitting barrels with the barrel contacting the inside shoulder only, the outside receiver ring only, and butting on the inside shoulder and the receiver ring both and have detected no noticeable difference in performance or accuracy. What do they figure is the best? My final question is—if and when I do get a good accurate bench rest gun built up, how good will it have to group to be satisfactory in competition and how long should it hold its accuracy—say in .222 caliber?

I know I'm asking for a pretty big order, but if and when you have time I'd sure appreciate hearing from you. I'm attempting to instigate more interest in bench rest shooting around here and I'd like to be a little bit of an authority on the subject; but if I depend on my own experience giving me all the answers, it'll take me the rest of my life. Bob L. Shane, Salt Lake City, Utah

Answer: A book could be written in answering your questions regarding the construction of a bench rest rifle. I will try to condense it into letter form, but don't blame me if the effort is not a success.

Six major factors affecting the results obtained with a bench rest rifle in the probable order of their importance are as follows:

1) CONSTRUCTION OF THE RECEIVER. Most modern day bench rest shooters are convinced that a flat bottom receiver is a liability if it is to be fastened to some other material, such as a wooden stock, for shooting. If the barrel is placed in a V-block, or if the receiver is left full floating, then no disadvantage accrues from the flat bottom or

square receiver. This is a reasonable conviction since the round receiver seeks its own center laterally and rotationally (some word, but legal) when properly fitted in its seat. It does not rotate in its seat about its long axis as some arm chair philosophers avow. The reason it does not rotate is perfectly obvious. With guard screws incorporating an 86 degree included angle under the head, properly tightened in a guard with mating angle in the screw seat, rotation is eliminated. The guard must be well fitted both ways for good results. This is true of any construction. Then if the screw holes in the guard and the stock are offset about .015" toward the butt from the receiver holes, simply tightening the screws pulls the receiver into place from all directions and keeps it there.

The opposite is true of the flat bottom or square receiver. If the receiver is fitted tight enough to prevent lateral shifting, then high friction on the sides prevents uniform return to position after the flexing caused by each shot. If the receiver is fitted loosely enough to prevent this, the difference in the coefficient of expansion will cause differences in dimensions large enough to allow lateral shifting.

2) BARREL. There are several characteristics of barrels which affect their ability to place the bullets through the same hole, but the most important is uniformity through the hole. If a barrel is not uniform from end to end then bullet yaw starts in the barrel (ballotement to artillery people) and bullet yaw is not conducive to best accuracy. Attempting to straighten out the bullet or damp the yaw with a constriction, no matter how small, at the muzzle end is only a stop gap method, a compromise, and will not produce the best results.

The next most important characteristic is finish. A rough hole which picks up metal fouling will not deliver each bullet the same at the muzzle. Barrels with good finish sometimes pick up powder fouling and produce the same nonuniform results. Proper cleaning with powder solvents, wire brush, and/or fine abrasive, prevents this accumulation.

The third most important characteristic is probably size. The groove diameter should be within .0003" of the bullet size. This is rule of thumb; a lot depends on the shape of the bullet, its construction and its bearing length. (We are talking about jacketed bullets.)

The fourth characteristic is the quality of the chambering job. A chamber with good finish, of proper size, and adequately centered with the bore, is a real asset. Chambers which are too large will cause off center firing pin blows and possibly inadequate ignition unless each case is oriented and inserted the same way for each firing. Too much expansion of the case neck (more than .004" or .005") will give short case life due to neck splits, particularly if the sizing die is a little small. Too little clearance over the neck will cause interference from non-uniform case wall thickness and consequent lousy accuracy. This is a statement of fact and can be substantiated.

The least important characteristics are straightness, wall thickness variation, and internal stresses. These are lumped together because they are related to a certain extent and their total effect is small on a large bench rest barrel. All of these items affect accuracy more with poor or mediocre ammunition.

3) BEDDING. A full floating barrel is certainly a desirable condition, if the point-of-impact is to stay the same under all conditions. The only catch is that the receiver must be properly constructed in order to attain accuracy with this method of bedding. The FN Mauser action is not constructed properly for a full floating barrel. The front guard screw being in the recoil shoulder at the front end of the receiver tends to pull the receiver down at this point without support. As a consequence, if there is nothing supporting the barrel, something bends, usually the receiver and the stock. Preloading, such as occurs under these conditions, is not conducive to the best accuracy. The probable reason is that the two parts do not flex uniformly under the load of firing. If 2 inches of the barrel ahead of the receiver are bedded the situation changes and the bedding job can be done without putting strain on the stock and receiver. A much better shooting rifle results. However, the square bottom receiver is not eliminated and continual rebedding will be required to keep it shooting well enough for hot bench rest competition.

The receiver must lay in the wood without strain. This can be accomplished by using certain inspection procedures during the bedding operations. Make sure the recoil lug is hitting essentially over its full rearward face. Check to determine its position while tightening and loosening the front guard screw with the rifle stood vertically on its butt. Lay a finger along side the action and against the stock. If the recoil shoulder is moving vertically off its seat you will be able to feel this movement with the finger placed as noted. Do the same with the tang of the receiver to determine if the rear guard screw is putting a bending strain at that point. Do not bed the receiver all the way to the center line. Bed on the bottom 140-160 degrees of a round receiver and clear the remaining 10-20 degrees on each side near the center line. The guard screws should not touch the wood. The guard should be bedded tightly to prevent shift in any direction. Do not compromise; if you

(Continued on Page Eighteen)

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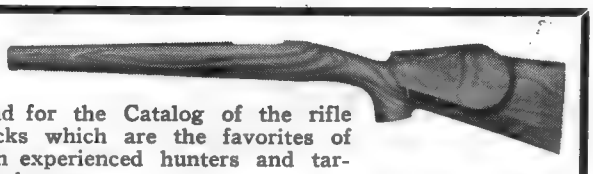

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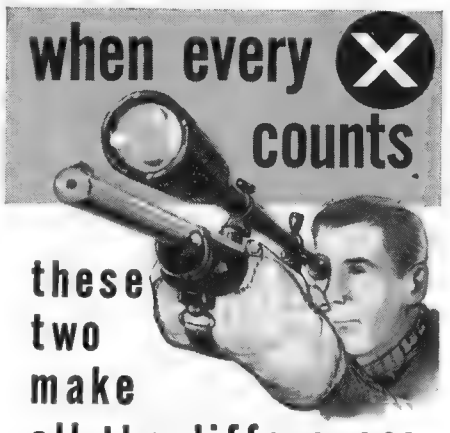

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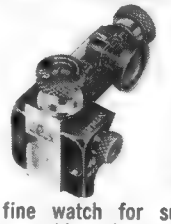

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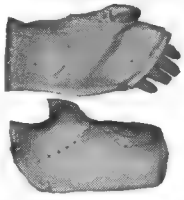

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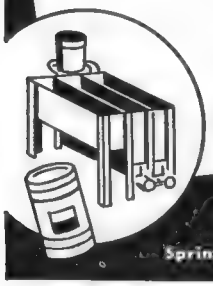

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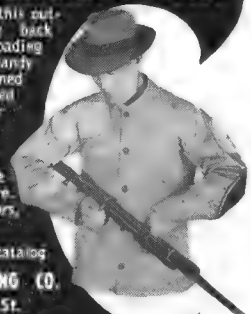

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Roy F. Dunlap

AMMUNITION TALK: After inspecting remains of M70 .300 H & H in which a tired case eliminated the right eye of a local Air Force man, I wish to recommend wearing glasses at all times when shooting, whether you need them to see better or not. Rifle did not fail; bolt, barrel and receiver undamaged, would still lock properly after accident, but a small section of cartridge base blew out, hot brass particles went back along left receiver wall, past bolt sleeve. The old Mauser flanged sleeve completely covering bolt runway is still a good idea. In above instance, case had been reloaded either three or four times.

The M1 has always been considered very "safe," as rifles go, but in event of ammunition failure, gas will go out sides of receiver between wood and metal joint, and can get out back in the face under rear end of receiver unless it has been glass-bedded to give considerable pressure at this point.

With all the old foreign-made ammunition now in the country and the natural attempts to reload some of the cases a lot of men are running into trouble learning to handle the Berdan primer pocket. There are few of the Belgian or German decapping tools in the U. S. and using a sharp ice-pick driven through the fired primer to pry it out can lead to trouble if you aren't careful. Even a small burr raised on top of the integral anvil in pocket may cause the primer to explode when repriming is attempted. In a proper tool there is little or no danger, of course—but the only proper tools for priming Berdan cases are those having a stop, or adjustable length priming arm which will not allow the seating punch to travel further than base-of case. The "C" type tools will fire primers easily unless great care is used. Berdan primers, of course, do not bottom in pockets.

For years I have had a good arrangement, having a couple of 6.5 X 55 m/m rifles, a lot of very, very good Svenska-Metallverken cases, and a shop to work in. First, I size the cases in regular RCBS die, minus decapping pin (this leaves necks same diameter); next, a shell holder is put on base of a small arbor press, the ram of which has a steel rod small enough to enter case mouth with a leather gasket (just a disc of leather held with screw in end of rod and turned on lathe to just over inside diameter of case necks). Throw cases into a pan of water, let them fill up, put in holder and go to work. Hydraulic action forces primers out. Same deal could be worked with hand plunger, but would be difficult to keep case and plunger lined up to avoid bending necks, etc. I use one of the small Lachmiller priming tools made by Bell, which has adjustable depth seating, to reprime cases.

TIP ON GLASS-BEDDING: Use of a quick-drying liquid wax on metal parts as a release compound leads to a better job. Very often the oils and greases used will contaminate the fibre-glass surface and prevent full hardening as well as leaving a pitted or rough contact area.

CREIGHTON AUDETTE mentions this month that the common belief that the grouping accuracy of light sporter rifles falls off after they become warmed by the first two or three shots may be "not necessarily so." Some of the editor's shooting supports Audette's contention. What has been **your** experience?

NORMA UNPRIMED CARTRIDGE CASES

After Harvey Donaldson's report of his experience in loading some NORMA unprimed cases in 7 X 57 Mauser caliber in the October issue (page 2), Mr. E. H. Sheldon, President of General Sporting Goods Corp., Ithaca, N. Y., the U. S. distributors of NORMA prdoucts, telephoned me and expressed unhappiness that this experience had been reported. He frankly admitted that some off-standard lots of NORMA products had gotten into trade channels, but that could and did happen with any product, which is quite true. He suggested that he send me some 7 X 57 cases from current stocks for checking, which I gladly agreed to do.

To be quite fair in the checking, I ordered boxes of 20 cases from several dealers in different areas in order to have samples from dealer stocks. I was able to obtain samples from three sources, all of different lot numbers. In fact, the seven boxes of 7 X 57 cases I have checked have represented six different lot numbers.

Harvey Donaldson sent me a sample of the cases he had trouble with, with the bullet seated. Everything that Harvey reported off-standard for U. S. specifications for the 7 X 57 Mauser case was quite correct. In addition, the base of the case was some .002" larger than U. S. specifications for a maximum 7 X 57 case, and probably would not have chambered in a normal U. S. chamber, and quite certainly not in a minimum chamber. We have since been advised that cases of the dimensions of those which Donaldson reported were designed to European specifications for machine gun use, and were distributed in the U. S. by error. To keep the record straight, Harvey Donaldson later wrote me that he had found another box of NORMA 7 X 57 cases which he had purchased about a year ago, and that they were OK in all respects.

When check measuring the 7 X 57 cases I used for reference the specifications for maximum case in Dunlap's GUNSMITHING, and those in the Lyman Reloading Hand Book (41st edition), which were in general close agreement. All lots of the 7 X 57 cases checked were well within the U. S. specifications for that case and would be quite OK to prime, neck size and expand, and load. Also, samples of NORMA cases in calibers .257 Roberts, .308 Winchester and .30-06 that I checked were OK in all dimensions.

Dunlap, in his description of the 7 X 57 Mauser case in his GUNSMITHING book mentions that this case has a shallower extraction groove than do other cartridges of similar size case heads, such as .30-06 and .250 Savage. At least some brands of the .257 Roberts case (which is based on the 7 X 57 case) also had this shallow extractor groove. The shell holder for my .257 loading dies, made by Johnson for his RED HEAD press, is made to accept the cases with the shallow extractor groove. Some Winchester Super-Speed .257 cases, fired as late as 1958 but date of manufacture unknown, did have the shallow extractor groove and shell holders for the .30-06 series of cartridges will not accept the head of this type of case. A sample Remington 7 X 57 case does have the deep extractor groove, as do the current lots of 7 X 57 NORMA cases, and the .30-06 size shell holders will accept these

cases. The current NORMA .257 cases also have the deep extractor groove.

In addition to checking outside dimensions of cases, I checked sample NORMA .308 and .30-06 cases for powder capacity by filling the cases brimming full of powder, striking-off level with the neck as in dip measring powder, and weighing the case full of powder.

Two new unfired NORMA .308 cases, each filled and weighed twice, averaged to hold, full, 46¾ grains 3031 powder. Two Western Super-X .308 cases, fired but full length resized, each filled twice and weighed, averaged 48½ grains 3031 powder. This would indicate that the NORMA cases have approximately the same powder capacity as some Remington .308 cases I have, and I would start loading the NORMA cases according to that information.

Two new unfired NORMA .30-06 cases, each filled and weighed twice, averaged to hold, full, 57½ grains of 3031 powder. Two Winchester SuperSpeed cases, fired and only neck sized and expanded, each filled twice and weighed, averaged to hold 59 grains of 3031 powder. Taking into consideration that the NORMA cases were unfired, while the SuperSpeed cases were expanded to chamber size from firing ,I would judge that the two cases, in like condition, would have approximately the same powder capacity for loading. **REMEMBER**, the powder weights given above fill cases completely full **AND ARE NOT POWDER CHARGES FOR LOADING.**

The flash-holes in all the NORMA cases of current distribution that I examined appeared, by visual inspection, to be quite uniform in size and very uniformly centered in the primer pocket—a feature that is not always true for some lots of our U. S. manufactured cartridge cases.

As a concluding comment: Humans are fallible, and some sub-standard lots of any product (usually small lots) may get by inspection and into the trade channels. Manufacturers of advertised, name brand products are proud of their products reputation and WANT any of their products which are actually sub-standard in either material or manufacturing, to be returned to them for replacement. If you do ever have occasion to return a sub-standard product to a manufacturer or distributor, along with your complaint story, supply the name and address of the dealer from whom you purchased the product. The dealer's name and address may assist in tracing other parts of a sub-standard lot that unintentionally got into trade channels, and withdrawing what can be located. Be Fair. Give the manufacturer a chance to make good before condemning all of his products.

P. H. T.

THE INFORMATION BENCH

The Information Bench service is available to all Precision SHOOTING readers. With your questions, send a large, stamped, self addressed return envelope for a reply. Selected questions and answers, covering as wide a variety of interests as possible, will be published in these columns. Address your questions to the following people.

Bench rest, varmint and hunting rifles, accessories, handloading, components and shooting methods—**M. H. Walker, THE INFORMATION BENCH, RFD #1, Box 118, Mohawk, N. Y.**

NRA and Free target rifles and shooting—**Roy F. Dunlap, 2319 Ft. Lowell Rd., Tucson, Arizona.**

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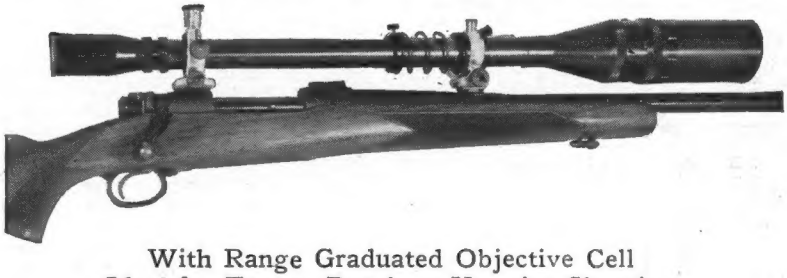

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5. National Match Course, Du Bois, Pa., 1957, 1st, 3rd, 6th, 7th places.
6. National Match 10-shot 100 yd. aggregate, Augusta, O. Al Creighton, .3105".
7. National Bench Rest Championship, Johnstown, New York, 1955, Sam Clark, Jr.
8. 10 Shot 200 yard WORLD RECORD, Du Bois, Pa., 1954, Sam Clark, Jr. Score, or Group, .5276"
9. 10 Shot 200 yard WORLD RECORD, Du Bois, Pa., 1956, H. L. Culver (Present record) Group size .4016"
10. 1000 Yard, Famous Wimbledon match, any sight, 1955, Camp Perry, O. Frank Conway.
11. 1000 Yard, Famous Wimbledon match, any sight, 1956, Camp Perry, O. Frank Conway.*
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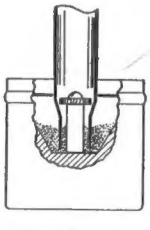

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Information Bench

(Continued from Page Fifteen)

can't do a good job on a stock start over with a new one.

4) BULLETS. Good bullets with proper loads will sometimes shoot in a lousy rifle, but poor bullets will not shoot under any circumstances. If you can't afford Match grade Sierra bullets or to make your own with good components, then forget bench rest shooting. I make my own .22 caliber and 6 m/m bullets in B&A dies using jackets which weigh within 0.2 grain and measure within .0004" on wall thickness. The lead cores weigh within 0.15 grain. This could go on and on so will stop here and try to answer your other questions.

As long as the threads are a snug fit and the shoulder square with the receiver shoulder the method of fitting, front or rear shoulder, should make no difference. I personally prefer fitting the big shoulder but then I don't use Mauser actions.

Now is the time to bring up testing methods and conclusions. If, under selected conditions, you are not obtaining 10 shot averages approaching .350"-.400" center to center at 100 yards and .750" to .900" at 200 yards, then you have not eliminated enough of the variables to draw a conclusion on much of any test. This is particularly true of minor rifle changes such as the method of barrel fitting mentioned. You may draw conclusions but it is unlikely that you have the facts on which to base them.

Your rifle will need to shoot .300" 10 shot averages under the best conditions at 100 yards and .700" 10 shot averages at 200 yards in order to win bench rest matches. You will note I said best conditions; this includes weather, shooter, rifle, and ammunition. Ideal conditions for all four occur very seldom. This is for testing only. After you once get it shooting, practice in the wind.

The details are a little skimpy here. If you have additional questions about details I will try to answer them. M. H. Walker

Question: I am interested in building a sporting rifle strictly for bench rest shooting. I have heard and read about your 6 m/m International case. Do you think that this would be a good one for this use? I would like to know also if there is anyone who makes chamber reamers for this case.

I have both a Springfield and a Mauser action I could use for this rifle. Which in your opinion would be the best? John C. Anderson, Fairview, So. Dak.

Answer: For a light rifle for Bench Rest shooting the standard .222 Remington or the .222 Remington Magnum would be the best choice, particularly since it will be shot from sand bags. Other things being equal, recoil is probably the deciding factor in obtaining small groups from the bench. The next best choice, one probably better suited for long range varmint shooting, would be a small 6 m/m cartridge such as the 6 m/m International. Keith Francis,

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Talent, Oregon, has made reamers for the 6 m/m International.

I personally would use the Springfield, because it makes a better looking rifle. As Bench Rest rifles without alteration, neither is any great shakes. M. H. Walker

Question: Would you be kind enough to tell me of the quality of finish and workmanship of the Schultz & Larsen S. S. rifle actions? Also, **who** is the importer of these actions and where can we buy one? Walter Vaughn, Littleton, Colorado

Answer: Workmanship on all Schultz & Larsen actions which I have examined was from good to excellent, none had evidence of poor workmanship.

These actions are available from Sharpe & Hart, Emmitsburg, Maryland. Whether or not they are the importers is not known.

As you probably know, the locking lugs on this bolt are about 3½ inches from the head of the cartridge. Some shooters dislike this locking system because of its additional strain movement under the load of firing. M. H. Walker

Question: What can you tell me of the life history of DUPONT PB Smokeless powder for use in shotshells?

When was this powder offered to the loaders, when was it withdrawn and why?

When I first started to hand load my shotshells I purchased a pound of this powder. It shot well I thought and I liked it very much. When I tried to buy some more I was told that it was no longer available. This may or may not be so but I have never run across any in my search. This leads me to believe it was only on the market a very short time. I will appreciate any help you can give me. H. Lynn Hunt, Rock Stream, N. Y.

Answer: For the life history of DuPont PB Smokeless Powder it is recommended you write to E. I. duPont de Nemours, Explosives Department, Chemical Sales Section, 1000 Empire State Building, 350 Fifth Ave., New York 1, N. Y.

DuPont PB-6 is available in ½ lb. cans according to the DuPont catalog. If your supplier does not have it, he has not tried to get it from the proper source. M. H. Walker

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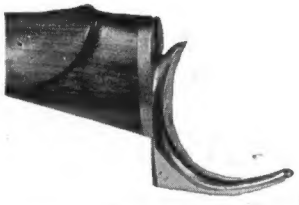

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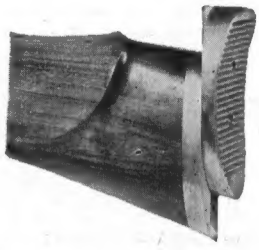

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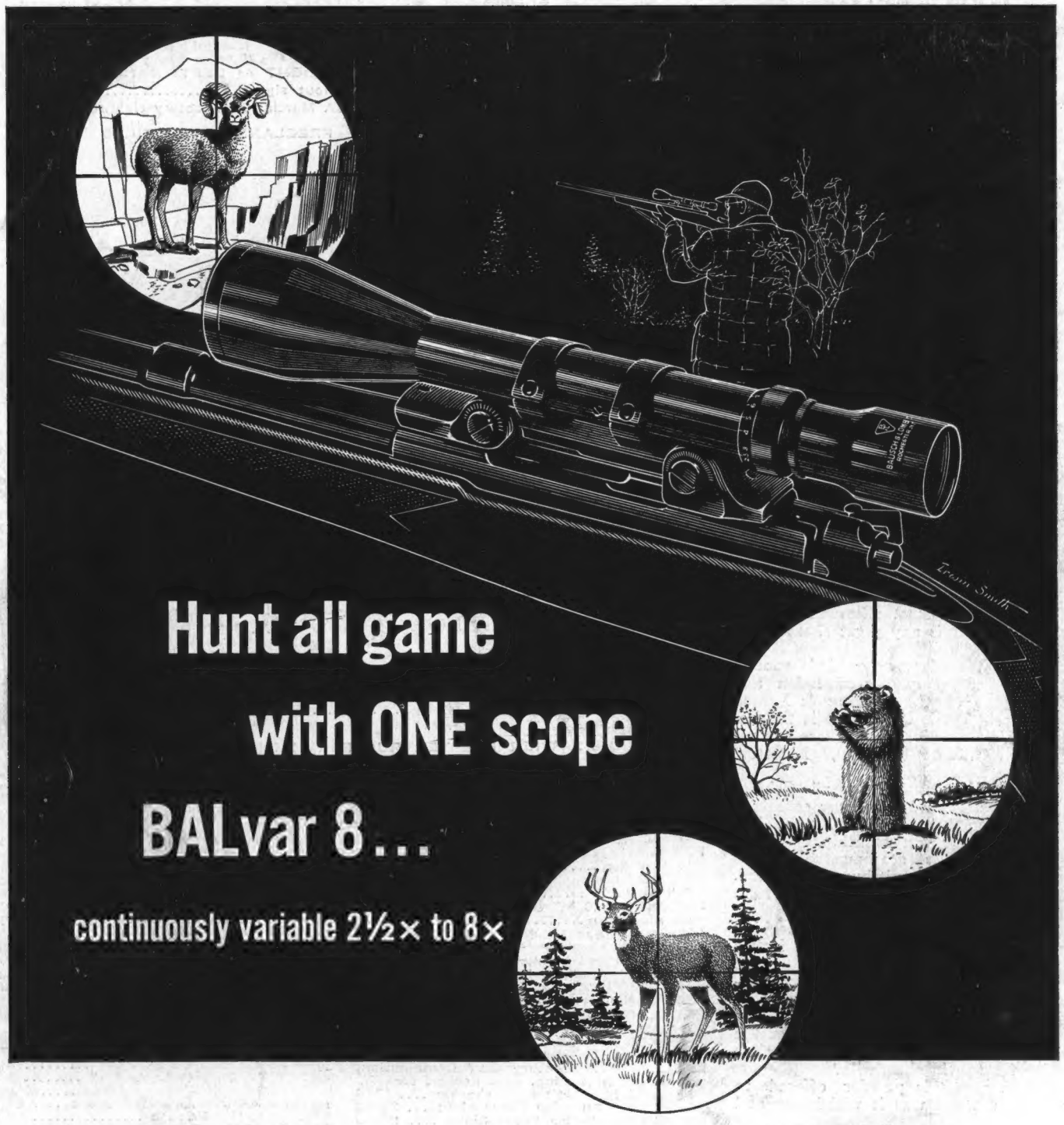

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